

AUTHORIZATION TO DISCHARGE UNDER THE
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of Chapter 46-12 of the Rhode Island General Laws, as amended,

**Rhode Island Airport Corporation
2000 Post Road
Warwick, Rhode Island**

is authorized to discharge from a facility located at

**T. F. Green Airport
2000 Post Road
Warwick, Rhode Island**

to receiving waters named

Unnamed Tributaries of Warwick Pond and Buckeye Brook,
and Tuscatucket Brook

in accordance with effluent limitations, monitoring requirements and other conditions set forth herein.

This permit shall become effective on January 1, 2005.

This permit and the authorization to discharge expire at midnight, five (5) years from the effective date.

This permit supersedes the permit issued on April 3, 1987.

This permit consists of 29 pages in Part I including effluent limitations and monitoring requirements, Storm Water Pollution Prevention Plan requirements, implementation schedules and reporting, etc. and 10 pages in Part II including General Conditions.

Signed this _____ day of _____, 2004.

Angelo S. Liberti, P.E., Chief of Surface Water Protection
Office of Water Resources
Rhode Island Department of Environmental Management
Providence, Rhode Island

TFGreen-Final-111204

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

1. During the period beginning on the effective date and lasting through permit expiration date, the permittee is authorized to discharge from outfall serial number(s) designated 002A, 003A, 008A, and 010A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - specify units		Concentration - specify units			Measurement Frequency	Sample Type
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)		
Flow	--- GPD	--- GPD				Quarterly ⁽⁶⁾⁽⁷⁾	Continuous ⁽¹⁾
pH			(6.5 SU)		(9.0 SU)	Quarterly ⁽⁶⁾⁽⁷⁾	Measurement
Temperature		--- °F				Quarterly ⁽⁶⁾⁽⁷⁾	Measurement
Oil & Grease					15 mg/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab ⁽⁴⁾⁽⁵⁾
TSS			--- mg/l		--- mg/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab ⁽⁴⁾⁽⁵⁾
BOD ₅			--- mg/l		--- mg/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Propylene Glycol			--- mg/l		--- mg/l	Quarterly ⁽⁶⁾	Grab/Composite ⁽²⁾⁽³⁾
COD			--- mg/l		--- mg/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Potassium(K ⁺)			--- mg/l		--- mg/l	Quarterly ⁽⁶⁾	Grab/Composite ⁽²⁾⁽³⁾
Sodium(Na ⁺)			--- mg/l		--- mg/l	Quarterly ⁽⁶⁾	Grab/Composite ⁽²⁾⁽³⁾
Total BTEX			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab ⁽⁴⁾⁽⁵⁾
MTBE			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab ⁽⁴⁾⁽⁵⁾
Total Petroleum Hydrocarbon			--- mg/l		--- mg/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab ⁽⁴⁾⁽⁵⁾

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - specify units		Concentration - specify units			Measurement Frequency	Sample Type
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily		
Benzo (a) Anthracene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Benzo (a) Pyrene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Benzo (b) Fluoranthene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Benzo (k) Fluoranthene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Chrysene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Dibenzo (a,h) Anthracene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Indeno (1,2,3-cd) Pyrene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Acenaphthene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Acenaphthylene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Anthracene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Benzo (ghi) Perylene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Fluoranthene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Fluorene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Naphthalene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Phenanthrene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Pyrene			--- ug/l		--- ug/l	Annual ⁽⁸⁾	Grab ⁽⁴⁾⁽⁵⁾
Surfactants			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Dissolved Oxygen			--- mg/l		--- mg/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Measurement
Total Organic Carbon (TOC)			--- mg/l		--- mg/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Fecal Coliform			--- MPN/100 ml		--- MPN/100 ml	Quarterly ⁽⁶⁾⁽⁷⁾	Grab ⁽⁴⁾⁽⁵⁾
Total Aluminum			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Antimony			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Arsenic			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Barium			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - specify units		Concentration - specify units			Measurement Frequency	Sample Type
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily		
Total Boron			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Calcium			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Chromium			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Copper			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Iron			--- mg/l		--- mg/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Lead			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Magnesium			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Manganese			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Selenium			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Sodium			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Thallium			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Tin			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾
Total Zinc			--- ug/l		--- ug/l	Quarterly ⁽⁶⁾⁽⁷⁾	Grab/Composite ⁽²⁾⁽³⁾

---signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

- ⁽¹⁾ Average Monthly Flow and Maximum Daily Flow shall be determined by the use of a continuous flow monitor for twelve (12) hours following the initiation of precipitation that generates runoff. Average Monthly Flow shall be reported for each outfall as the arithmetic average of the flow measurements made during each monitoring event. Maximum Daily Flow shall be reported for each outfall as the maximum of the flow measurements made during each monitoring event.
- ⁽²⁾ Analytical results reported as Average Monthly must be determined from composite samples taken with a continuous sampler or as a combination of a minimum of twelve-(12) sample aliquots taken during the first twelve-(12) hours following the initiation of precipitation that generates runoff with each aliquot being at least 100 ml and collected at a minimum of hourly intervals. Composite samples can be either flow-weighted or time-weighted. During snow events, the start of precipitation shall be assumed to occur when the total accumulation of snowfall is 0.5 inches in depth. During other freezing (i.e., sleet, freezing rain) or non-freezing (i.e., rain) precipitation events, the start of precipitation shall be assumed to occur when the total accumulation is 0.1 inches in depth.
- ⁽³⁾ Analytical results reported as Maximum Daily must be the maximum of the composite samples or the maximum of the twelve (12) sample aliquots collected during the twelve (12) hour period for all measured storm events for each reporting quarter in accordance with Note (2) above.
- ⁽⁴⁾ Analytical results reported as Average Monthly must be determined from the arithmetic average of three (3) individual hourly grab samples taken during the first three (3) hours following the initiation of precipitation that generates runoff.
- ⁽⁵⁾ Analytical results reported as Maximum Daily must consist of a single grab sample collected during the period starting twenty (20) minutes following the initiation of

precipitation that generates runoff and commencing no later than three (3) hours following the initiation of precipitation that generates runoff. If the collection of a grab sample during the specified time period could not be achieved, a sample can be taken during the a subsequent period not to exceed six (6) hours following the initiation of precipitation that generates runoff, providing the permittee submit with the monitoring report, a description of why a sample during the specified period could not be collected.

- ⁽⁶⁾ Sampling required for Quarter 1 and Quarter 4. One (1) precipitation event shall be monitored for Quarter 1 and one (1) precipitation event shall be monitored for Quarter 4 while aircraft deicing is occurring. Quarter 1 is defined as the period from January 1 through March 31, and Quarter 4 is defined as the period from October 1 through December 31.
- ⁽⁷⁾ Sampling required for Quarter 2 and Quarter 3. One (1) precipitation event shall be monitored for Quarter 2 and one (1) precipitation event shall be monitored for Quarter 3. Quarter 2 is defined as the period from April 1 through June 30, and Quarter 3 is defined as the period from July 1 through September 30.
- ⁽⁸⁾ Sampling required for the sixteen (16) PAHs on an annual basis. One (1) precipitation event shall be monitored during any Quarter of the year. The Quarter will be decided at the permittee's discretion and can change during each year of the permit's term.

*Values in parentheses () are to be reported as Minimum/Average/Maximum for the reporting period rather than Average Monthly/Average Weekly/Maximum Daily. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfalls 002A, 003A, 008A, and 010A.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

2. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number(s) designated 001A, 004A, 004B, 004C, 005A, 006A, 006B, 006C, 006D, 007A, 007B, 009A, 011A and 012A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - specify units		Concentration - specify units			Measurement Frequency ⁽⁵⁾	Sample Type
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)		
Flow		--- GPD				2/Year ⁽⁶⁾	Estimate ⁽⁴⁾
pH			(6.5 SU)		(9.0 SU)	2/Year ⁽⁶⁾	Measurement
Oil & Grease					15 mg/l	2/Year ⁽⁶⁾	Grab ⁽²⁾⁽³⁾
TSS			--- mg/l		--- mg/l	2/Year ⁽⁶⁾	Grab/Composite ⁽¹⁾⁽³⁾
BOD ₅			--- mg/l		--- mg/l	Annual	Grab/Composite ⁽¹⁾⁽³⁾
Fecal Coliform			--- MPN/100 ml		--- MPN/100 ml	Annual	Grab ⁽²⁾⁽³⁾
Potassium (K ⁺)			--- mg/l		--- mg/l	Annual	Grab/Composite ⁽¹⁾⁽³⁾
Sodium (Na ⁺)			--- mg/l		--- mg/l	Annual	Grab/Composite ⁽¹⁾⁽³⁾

---signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

- ⁽¹⁾ Results reported as Average Monthly must be determined from composite samples consisting of a minimum of three (3) sample aliquots taken during the first three (3) hours following the initiation of precipitation with each aliquot being at least 100 ml and collected at a minimum of fifteen (15) minute intervals. Composite samples can be either flow-weighted or time-weighted. During snow events, the start of precipitation shall be assumed to occur when the total accumulation of snowfall is 0.5 inches in depth. During other freezing (i.e., sleet, freezing rain) or non-freezing (i.e., rain) precipitation events, the start of precipitation shall be assumed to occur when the total accumulation is 0.1 inches in depth.
- ⁽²⁾ Analytical results reported as Average Monthly must be determined from the arithmetic average of three (3) individual hourly grab samples taken during the first three (3) hours following the initiation of precipitation that generates runoff.
- ⁽³⁾ Analytical results reported as Maximum Daily must consist of a single grab sample collected during the period starting twenty (20) minutes following the initiation of precipitation that generates runoff and commencing no later than three (3) hours following the initiation of precipitation that generates runoff. If the collection of a grab sample during the specified time period could not be achieved, a sample can be taken during the a subsequent period not to exceed six (6) hours following the initiation of precipitation that generates runoff, providing the permittee submit with the monitoring report, a description of why a sample during the specified period could not be collected.
- ⁽⁴⁾ Maximum Daily Flow shall be reported as the total daily flow during the monitoring event. This total daily flow shall be the total volume calculated utilizing the SCS curve number method and the total precipitation reported for that event.

⁽⁵⁾ Sampling required for at least one (1) precipitation event during Quarter 1 or Quarter 4 while aircraft deicing is occurring. Quarter 1 is defined as the period from January 1 through March 31, and Quarter 4 is defined as the period from October 1 through December 31.

⁽⁶⁾ For Flow, pH, Oil & Grease, and TSS one (1) sampling event shall occur during Quarter 1 or Quarter 4 per the requirements of Footnote (5). The second sampling event may occur during a precipitation event during any calendar quarter.

* Values in parentheses () are to be reported as Minimum/Average/Maximum for the reporting period rather than Average Monthly/Average Weekly/Maximum Daily. Samples taken in compliance with the monitoring requirements specified above shall be taken at the following locations: Outfalls 001A, 004A, 005A, 006A, 007A, 009A, 011A, and 012A.

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

3. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 100A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - specify units		Concentration - specify units			Measurement Frequency	Sample Type
	Average Monthly	Maximum Daily	Average Monthly *(Minimum)	Average Weekly *(Average)	Maximum Daily *(Maximum)		
Flow	--- GPM ⁽¹⁾	--- GPM ⁽²⁾				1/Discharge	Estimate ⁽³⁾
pH			(6.5 SU)		(9.0 SU)	1/Discharge	Measurement
Benzene			5.0 ug/l		5.0 ug/l	1/Discharge	Grab
Toluene			--- ug/l		--- ug/l	1/Discharge	Grab
Ethylbenzene			--- ug/l		--- ug/l	1/Discharge	Grab
Total Xylenes			--- ug/l		--- ug/l	1/Discharge	Grab
Total BTEX			100 ug/l		100 ug/l	1/Discharge	Grab
MTBE			--- ug/l		--- ug/l	1/Discharge	Grab
Total Iron			--- mg/l		--- mg/l	1/Discharge	Grab
Benzo (a) Anthracene			--- ug/l		--- ug/l	1/Discharge	Grab
Benzo (a) Pyrene			--- ug/l		--- ug/l	1/Discharge	Grab
Benzo (b) Fluoranthene			--- ug/l		--- ug/l	1/Discharge	Grab
Benzo (k) Fluoranthene			--- ug/l		--- ug/l	1/Discharge	Grab
Chrysene			--- ug/l		--- ug/l	1/Discharge	Grab
Dibenzo (a,h) Anthracene			--- ug/l		--- ug/l	1/Discharge	Grab
Indeno (1,2,3-cd) Pyrene			--- ug/l		--- ug/l	1/Discharge	Grab

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - specify units		Concentration - specify units			Measurement Frequency	Sample Type
	Average	Maximum	Average	Average	Maximum		
	<u>Monthly</u>	<u>Daily</u>	<u>Monthly</u> *(Minimum)	<u>Weekly</u> *(Average)	<u>Daily</u> *(Maximum)		
Acenaphthene			--- ug/l		--- ug/l	1/Discharge	Grab
Acenaphthylene			--- ug/l		--- ug/l	1/Discharge	Grab
Anthracene			--- ug/l		--- ug/l	1/Discharge	Grab
Benzo (ghi) Perylene			--- ug/l		--- ug/l	1/Discharge	Grab
Fluoranthene			--- ug/l		--- ug/l	1/Discharge	Grab
Fluorene			--- ug/l		--- ug/l	1/Discharge	Grab
Naphthalene			--- ug/l		--- ug/l	1/Discharge	Grab
Phenanthrene			--- ug/l		--- ug/l	1/Discharge	Grab
Pyrene			--- ug/l		--- ug/l	1/Discharge	Grab
Total Petroleum Hydrocarbon			--- mg/l		1.0 mg/l	1/Discharge	Grab

---signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

⁽¹⁾ Average Monthly Flow shall be reported as the arithmetic average of the Maximum Daily Flows recorded for each discharge during the quarterly reporting period.

⁽²⁾ Maximum Daily Flow shall be reported as the maximum of the flow rates recorded for each discharge during the quarterly reporting period determined by time for the initial computed volume of accumulated storm water to drain from the AST fuel farm containment dike.

⁽³⁾ Monitor flow and submit a flow log with the monitoring results. The flow log shall include the rate and duration of flow including the time(s) of day when flow commences and ceases. At a minimum, the flow must be measured and reported each time a sample is collected.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 100A (the effluent from the AST fuel farm water treatment system).

PART I

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

4. During the period beginning on the effective date and lasting through permit expiration, the permittee is authorized to discharge from outfall serial number 200A. Such discharges shall be limited and monitored by the permittee as specified below:

Effluent Characteristic	Discharge Limitations					Monitoring Requirement	
	Quantity - specify units		Concentration - specify units			Measurement Frequency	Sample Type
	Average Monthly	Maximum Daily	Average Monthly	Average Weekly	Maximum Daily		
Flow	--- GPM ⁽¹⁾	--- GPM ⁽²⁾				Per Discharge ⁽³⁾	Estimate
Propylene Glycol			--- mg/l		--- mg/l	Per Discharge ⁽⁴⁾	Grab

---signifies a parameter which must be monitored and data must be reported; no limit has been established at this time.

- ⁽¹⁾ Average Monthly Flow shall be reported as the arithmetic average of the Maximum Daily Flows recorded for each discharge during the quarterly reporting period.
- ⁽²⁾ Maximum Daily Flow shall be reported as the maximum flow rate recorded for each discharge during the quarterly reporting period determined by time for the initial computed volume of accumulated water to drain from the containment structure.
- ⁽³⁾ Monitor flow and submit a flow log with the monitoring results. The flow log shall include the depth of water prior to initiation of discharge, duration of flow and the time(s) of day when flow commences and ceases.
- ⁽⁴⁾ Once per the course of the discharge a grab sample shall be taken and analyzed for propylene glycol using EPA Method 8270 (or an approved alternative). This concentration shall be the value reported to this Office for compliance monitoring purposes.

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location: Outfall 200A (the effluent of the containment structure prior to the discharge of accumulated storm water).

5. Special Conditions/Authorizations/Prohibitions:

- a. This permit also authorizes the discharge of storm water from outfalls 004B, 004C, 006B, 006C, 006D, and 007B. Outfalls 004A, 006A, and 007A are in the same drainage areas with similar industrial activities, therefore, monitoring from outfalls 004A, 006A, and 007A are considered representative.
- b. Non-storm water discharges including those from rubber removal practices and dry weather discharges of deicing/anti-icing chemicals are not authorized by this permit. Dry weather discharges are those discharges generated by processes other than those included in the definition of storm water. In RIPDES Rule 3, the definition of storm water includes storm water runoff, snowmelt runoff, and surface runoff and drainage. All other discharges constitute non-storm water discharges. Discharges of process wastewater or spills in snowmelt runoff are not authorized except the discharge from Outfall 200A of accumulated storm water from the containment structure associated with the recovered glycol processing system as established in Part I.A.4.
- c. Unless identified by the permittee or the RI DEM as significant sources of pollutants to waters of the United States, the following non-storm water discharges are authorized under this permit to enter the storm water drainage system: discharges from fire fighting activities; fire hydrant flushings; external building washdown that does not use detergents; lawn watering; uncontaminated groundwater; springs; air conditioning condensate; potable waterline flushings; and foundation or footing drains where flows are not contaminated with process materials, such as solvents, or contaminated by contact with soils, where spills or leaks of toxic or hazardous materials has occurred. If any of these discharges may reasonably be expected to be present and to be mixed with storm water discharges, they must be specifically identified and addressed in the facility's Storm Water Pollution Prevention Plan (SWPPP).
- d. This permit does not authorize discharges to the separate storm sewer system or to waters of the State from floor drains and trench drains located inside of buildings and/or hangars.
- e. This permit does not authorize discharges to the separate storm sewer system or to waters of the State from vehicle, airplane, or equipment washing activities.
- f. This permit does not authorize the use of any aircraft deicing/anti-icing fluid (ADF/AAF) which displays greater toxicity than the products currently used at the Airport. The toxicity of the ADF/AAF products shall not be greater than 3,300 mg/l as determined by a 96-h LC₅₀ bioassay test on *Pimephales promelas* (Fathead minnow) expressed as Propylene Glycol.
- g. The pH of the effluent shall not be less than 6.5 nor greater than 9.0 standard units at any time, unless these values are exceeded due to natural causes or as a result of the approved treatment processes.
- h. All samples must be collected from a discharge(s) resulting from a representative storm event that occurs at least seventy-two (72) hours from the previous measurable storm event, which is 0.1 inches water equivalent per twenty-four (24) hours in magnitude. A representative storm event should be within 50% of the average storm event in Rhode Island for both depth and duration, but in no case less than 0.1 inches per twenty-four (24) hours in magnitude. The average storm event in Rhode Island is 0.7 inches in depth and 12 hours in duration.

- i. In addition to the required sampling results submitted in accordance with Part I.A.1. and I.A.2. of this permit, the permittee must provide the date and duration (hours) of the storm event sampled, the total depth of rainfall (inches), and the total volume of runoff (Ft³).
 - j. If the permittee is unable to collect samples due to adverse climatic conditions or no flow conditions, the permittee must submit, in lieu of sampling data, a description of why samples could not be collected, including available precipitation data for the monitoring period. The permittee can only exercise this waiver once per year for outfalls designated 002A, 003A, 008A, and 010A; and once in two (2) years for outfalls designated 001A, 004A, 005A, 006A, 007A, 009A, 011A and 012A.
 - k. The discharges shall not cause visible discoloration of the receiving waters that would impair any usages specifically assigned to the receiving waters.
 - l. The discharges shall not cause odors in the receiving waters to such a degree as to create a nuisance or interfere with the existing or designated uses.
 - m. The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time.
 - n. The discharges shall not cause or contribute to any stream bank erosion and/or cause or contribute to any soil erosion and sedimentation.
6. All existing manufacturing, commercial, mining, and silvicultural dischargers must notify the Director as soon as they know or have reason to believe:
- a. That any activity has occurred or will occur which would result in the discharge, on a routine or frequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) One hundred micrograms per liter (100 ug/l);
 - (2) Two hundred micrograms per liter (200 ug/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 ug/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitro-phenol; and one milligram per liter (1 mg/l) for antimony;
 - (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. s122.21(g)(7); or
 - (4) Any other notification level established by the Director in accordance with 40 C.F.R. s122.44(f) and Rhode Island Regulations.
 - b. That any activity has occurred or will occur which would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
 - (1) Five hundred micrograms per liter (500 ug/l);
 - (2) One milligram per liter (1 mg/l) for antimony;
 - (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 C.F.R. s122.21(g)(7); or

- (4) Any other notification level established by the Director in accordance with 40 C.F.R. s122.44(f) and Rhode Island Regulations.
 - c. That they have begun or expect to begin to use or manufacture as an intermediate or final product or by-product any toxic pollutant which was not reported in the permit application.
7. Aboveground Storage Tank (AST) Fuel Farm:
- a. The permittee shall properly operate and maintain the AST fuel farm storm water treatment system, which is located within Drainage Area 13. Mechanical failure or breakthrough of the treatment system (exceedance of any permit limits) shall be immediately reported to the Office of Water Resources.
 - b. The permittee shall treat all stormwater pumped from the containment dike associated with the AST fuel farm in Drainage Area 13 with a Granular Activated Carbon treatment system designed to meet the effluent limitations listed in Part I.A.3. The system shall not be modified without written approval from the Office of Water Resources.
 - c. The treatment system shall be inspected at a minimum of once per month to assure the system is operating efficiently and to look for evidence of iron bacteria build-up. As a result of these inspections, appropriate actions shall be taken immediately to resolve any problems discovered during the inspection (i.e., removal of iron scale). Records documenting the inspections and any actions taken shall be retained and made available to the Office of Water Resources upon request.
 - d. Discharge shall cease if any of the contaminants listed in Part I.A.3. are found in the effluent above the detection limits listed in Part I.C. The discharge may recommence once steps have been taken to ensure the limits will not be exceeded again. At a minimum, these steps shall include replacement of the activated carbon filter.
8. Recovered Glycol Processing:
- a. The permittee shall properly operate and maintain the recovered glycol processing system and related containment structure, which is to be located adjacent to Taxiway N within Drainage Area 1. Mechanical failure or exceedance of any permit limits shall be immediately reported to the Office of Water Resources.
 - b. Screening for the presence of propylene glycol shall be performed prior to the discharge of any accumulated storm water from the containment structure. Screening shall be performed using a refractometer capable of reading accurately to a BRIX scale of 0-15 to a resolution of 0.1 BRIX units. If such screening indicates that a concentration of more than one (1) percent propylene glycol is present, accumulated storm water shall be collected and transported to a permitted treatment facility or reintroduced to appropriate storage tanks for the recovered glycol processing system.
 - c. If screening for the presence of propylene glycol using a refractometer indicates a concentration less than or equal to one (1) percent propylene glycol, the accumulated storm water may be discharged. No discharge shall be allowed unless screening determines that propylene glycol is not present in accumulated storm water above these levels.

- d. Discharges of storm water are allowed with no monitoring only following the submittal of certification by the permittee indicating that no fluids containing propylene glycol are stored in containers or equipment within the containment structure. Monitoring shall be subsequently required for any storm water discharge following the reintroduction of fluids containing propylene glycol to containers or equipment within the containment structure.
 - e. Any discharges occurring while fluids containing propylene glycol are located within the containment structure shall be limited and monitored by the permittee as specified in Part I.A.4. of the Permit.
9. This permit serves as the State's Water Quality Certificate for the discharges described herein.

B. STORM WATER POLLUTION PREVENTION PLAN REQUIREMENTS

1. As of the effective date of this permit, RIAC shall implement the Storm Water Pollution Prevention Plan (referred to herein as the "SWPPP" and "the Plan") developed by the permittee dated November 2002 and amended January 2004 (updated map of deicing areas and controls only). The SWPPP shall be maintained in accordance with good engineering practices and shall identify potential sources of pollutants that may reasonably be expected to affect the quality of storm water discharges associated with industrial activity from the facility. The SWPPP shall include a site map that consists of a delineation of the drainage area of each storm water outfall, each existing structural control measure to reduce pollutants in storm water runoff, locations where significant materials are exposed to storm water, locations where significant leaks or spills have occurred, a delineation of all impervious surfaces, all surface water bodies, all separate storm sewers, and the locations of the following activities where such areas are exposed to storm water: fueling stations, vehicle and equipment maintenance and/or cleaning areas, material handling areas, material storage areas, process areas, waste disposal areas, airplane deicing and anti-icing areas, glycol storage, processing and handling areas, and runway deicing and rubber removal. The site map shall also include: all underground injection control (UIC) systems, including systems that are owned or operated by RIAC's tenants; all outfall pipes, including pipes that are owned or operated by RIAC's tenants; all aboveground storage tanks (ASTs) and underground storage tanks (USTs), including tanks that are owned or operated by RIAC's tenants; and all floor drains in each building, including floor drains that are located in buildings that are owned or operated by RIAC's tenants (the location of the discharge point must be provided for each floor drain). In addition, the Plan shall describe and ensure the implementation of Best Management Practices (BMPs) that are to be used to reduce or eliminate the pollutants in storm water discharges associated with industrial activity at the facility and to assure compliance with the terms and conditions of this permit. The SWPPP shall identify in the site map dedicated airplane deicing areas, glycol storage areas, and vehicle washing areas and contain procedures to ensure that these activities occur only in the areas identified in the SWPPP.
2. Within one hundred and eighty (180) days of the effective date of this permit, RIAC shall amend the SWPPP to include additional BMPs in accordance with Part B.4. of the permit.
3. The Director may notify the permittee at any time that the Plan does not meet one or more of the minimum requirements of the permit. After such notification from the Director, the permittee shall make changes to the Plan and shall submit to the Director a written certification that the requested changes have been made. Unless otherwise provided by the Director, the permittee shall have thirty (30) days after such notification to make the necessary changes. The permittee shall immediately amend the Plan whenever: 1) there is

a change in design, construction, operation, or maintenance, which has a significant effect on the potential for the discharge of pollutants to the waters of the State; 2) a release of reportable quantities of hazardous substances and oil; or 3) if the SWPPP proves to be ineffective in achieving the general objectives of controlling pollutants in storm water discharges associated with industrial activity. Changes must be noted and then submitted to this Department within thirty (30) days of amending the plan. Amendments to the Plan may be reviewed by the Department in the same manner as specified above.

4. The amended SWPPP, at a minimum shall contain the following items:

- a. Deicing Fluid Collection and Management. A description of equipment and operation and management procedures related to deicing fluid usage and collection. The permittee shall implement a glycol recovery program designed to achieve compliance with water quality standards and criteria in the receiving waters such as dissolved oxygen, aquatic toxicity, foaming, nuisance odors, and nuisance bacteria or algae growths associated with the discharge of deicing chemicals. The description of such operations and procedures must address the following minimum components:

- (1) *Collection Program Operating Procedures.* Standard operating procedures and overall glycol recovery goals for the collection program must be detailed. Operations and equipment for the various components of the collection program that must be addressed include, at a minimum, the following:
 - i. Overall collection efficiency goals for glycol collection program;
 - ii. Seasonal collection program operating schedule including procedures and a schedule to ensure that all collection, handling, and processing equipment is on-site and operational prior to September 15th of each year. The operating schedule shall be submitted annually with the third quarter Discharge Monitoring Report (DMR) forms due by October 15th;
 - iii. Location and operation of catch basin valve inserts;
 - iv. Dry weather and wet weather operating procedures;
 - v. Operation of mobile collection units;
 - vi. Operation of glycol interceptor equipment;
 - vii. Management and description of glycol storage tanks;
 - viii. Recordkeeping forms and procedures;
 - ix. Operation of glycol processing facility;
 - x. Management of storm water retained in glycol processing facility containment structure; and
 - xi. Training program for glycol collection and processing facility personnel.
- (2) *Annual Deicing Fluid Collection and Management Report.* An annual report must be prepared which provides a summary and description of glycol usage, collection and management activities during the previous deicing season. Such report shall be submitted no later than June 15 following the deicing season and must include, at a minimum, the following:

- i. Tabular summary of aircraft deicing fluid usage and collection volumes (daily log of volumes of glycol used by each tenant/entity, total glycol used and collected per day that deicing occurs, total glycol used and collected annually, annual % glycol collected, and % glycol collected per storm event);
- ii. Summary of overall seasonal weather conditions;
- iii. A summary of each event specific report that includes a discussion of types and timing of storms and resulting effect(s) on collection activities for each individual storm event;
- iv. An overall summary and event specific discussion of outfall and in-stream monitoring results for sampling events conducted under Part I.A.1 and Part I.B.4.h.;
- v. A summary of all odor complaints received and any investigations and related amendments to the SWPPP and associated BMPs,
- vi. A summary of all flow weighted sampling for each wet weather event that airplane deicing occurs as specified in Part I.B.4.a.(4).vi. The report shall compare the annual average of all event specific results to the benchmark value of 3,300 ppm. If the annual average concentration exceeds the benchmark value, the recommendations required in Part vii of this section must specifically address amendments to the SWPPP and BMPs designed to meet the benchmark value. Upon DEM review of the annual report, in accordance with Part I.B.3., the DEM may notify the permittee that the Plan does not meet one or more of the minimum requirements of the permit. Unless otherwise provided by the Director, the permittee shall have thirty (30) days after such notification to make the necessary changes.
- vii. Recommendations for usage and collection procedures, and equipment to improve collection efficiencies and overall program management, enhanced BMPs and recommendations to amend the SWPPP. This shall include an assessment of the applicability of source reduction BMPs such as anti-icing techniques and innovative technologies as well as an assessment of practices and procedures employed during the monitoring event to identify necessary improvements for the next deicing season. The recommendations must include a schedule to amend the SWPPP and implement enhanced BMPs subject to the Director's approval.

(3) *Wet Weather Deicing Event Specific Deicing Fluid Collection and Management Report.* For each wet weather event in which aircraft deicing occurs, an event specific report must be prepared. Such report(s) shall be submitted with the DMR Forms as specified in Part I.D, and must include, at a minimum, the following:

- i. Tabular summary of aircraft deicing fluid usage and collection volumes (daily log of volumes of glycol used by each tenant/entity, total glycol used and collected per day that deicing occurs, and % glycol collected per storm event. The report shall identify the amounts used and collected for each deicing area and/or gate,

amount collected at the catch basin inserts and at the glycol interceptor(s);

- ii. Summary of climatic conditions that includes a discussion of types and timing of storms and resulting effect(s) on collection activities for each individual storm event;
- iii. A daily log of collection efforts and glycol monitoring that includes the number of employees dedicated to collection efforts, the times and amounts collected from each dedicated deicing area, times and locations of collection efforts at each gate and each catch basin insert, the amount diverted at each glycol interceptor, the number and type of collection equipment utilized, hourly monitoring results at catch basin inserts, and efforts made to monitor and collect runoff prior to collecting at the catch basin inserts, efforts made to monitor and collect runoff in a timely manner as soon as practical to the time of application, and identification of any impediments to timely and efficient collection of concentrated runoff prior to dilution and observations and/or recommendations for improvements.
- iv. A summary and event specific discussion of outfall and in-stream monitoring results for sampling events conducted under Part I.A.1 and Part I.B.4.h.;
- v. A summary of any odor complaints received during or subsequent to the deicing event and any associated investigations performed by RIAC;
- vi. A summary of all flow weighted sampling for each wet weather event that airplane deicing occurs as specified in Part I.B.4.a.(4).vi. The report shall compare the event specific results to the benchmark value of 3,300 ppm of propylene glycol; and
- vii. Recommendations for usage and collection procedures, equipment to improve collection efficiencies and overall program management, enhanced BMPs and recommendations to amend the SWPPP. This shall include an assessment of the applicability of source reduction BMPs such as anti-icing techniques and innovative technologies as well as an assessment of practices and procedures employed during the monitoring event to identify necessary improvements for the next wet weather deicing event. The permittee shall immediately amend the plan in accordance with Part I.B.3. and submit changes to the plan to the DEM within thirty (30) days of amending the plan.

- (4) *Aircraft and Pavement Deicing Material Usage, Storage, and Collection.* The permittee shall develop and implement practices for the management of aircraft and pavement deicing materials. The practices shall be designed to minimize the discharge of aircraft deicing fluids. Practices should include a consideration of minimizing fluids applied to aircraft through improved application methods and innovative deicing technologies. Practices should include the development of collection and disposal strategies to include an evaluation of glycol recycling. Procedures shall include an evaluation of measures to minimize contact with storm

water, to minimize the volumes of glycols used (with due consideration of FAA requirements and safety) as well as measures to prevent releases from accidental leaks and spills of deicing materials. The permittee shall develop an airport deicing plan. This plan shall establish practices and procedures for the application and collection of aircraft deicing fluids as well as pavement deicers. This plan shall be developed in cooperation with tenants and personnel involved with application and collection of deicing materials. With due consideration of safety and other regulatory requirements, such as FAA, the goal of the program shall be to minimize the discharge of deicing materials as follows:

- i. The permittee shall evaluate FAA approved ADFs that are new or demonstrate less aquatic toxicity than those currently in use. Annually the permittee must provide information to tenants identifying less toxic ADFs encouraging tenants to utilize the most environmentally sensitive FAA approved ADFs.
- ii. The permittee shall evaluate the feasibility of preventative anti-icing techniques. Annually the permittee shall provide information to tenants identifying various practices and encouraging the tenants to implement techniques as practicable.
- iii. The permittee shall evaluate aircraft deicing fluid application practices to identify means to reduce the discharge of aircraft deicing fluid. This shall include an evaluation of technologies such as hot air-low flow application equipment and techniques such as protective enclosures for applicators as well as varying the aircraft deicing fluid concentrations dependent upon ambient conditions. Annually the permittee shall provide information to tenants identifying various practices and encouraging the tenants to implement techniques as practicable.
- iv. The permittee shall coordinate with tenants, deicing application and collection efforts, and air traffic control to minimize holdover times for aircraft with the goal of eliminating or reducing the need for repeated deicing/anti-icing and reducing the amount of aircraft deicing fluid applied for secondary deicing. Annually the permittee shall assess the effectiveness of measures implemented during the deicing season, provide information to tenants and air traffic control, and identify improvements for implementation during the next deicing season.
- v. The permittee shall submit a plan subject to the Director's approval that:

Reduces the number and size of areas in which aircraft deicing occurs to maximum extent practicable;

Ensures that aircraft deicing fluids (ADFs) do not enter the storm drainage system during dry weather events. Catch basin inserts shall be installed in each of the dedicated storm sewer systems where aircraft deicing occurs shall remain closed during all dry weather deicing events to prevent the discharge of aircraft deicer contaminated runoff from all primary and secondary

aircraft deicing areas, as identified in the approved SWPPP. Procedures shall be implemented during peak deicing times in wet weather events to include hourly monitoring of glycol concentrations in the runoff from deicing areas collected at the inserts using monitoring technology capable of detecting concentrations of > 1%.

Ensures that all aircraft deicing areas are served by dedicated storm water collection systems designed to minimize the amount of dilution from storm water run-on or collection of storm water or infiltrating groundwater from areas up-gradient of the dedicated area not associated with aircraft deicing activities.

Provides dedicated recovery/scavenging equipment for each area where deicing occurs and associated temporary or day storage tanks of adequate capacity located in an area that will allow recovery/scavenging equipment to expeditiously resume collection activities after reaching capacity.

Implements automated glycol sensing controls in each of the dedicated aircraft deicing areas capable of diverting and preventing the discharge of concentrations of propylene glycol greater than 1%. The positive control must be located in an area in the dedicated collection system as close as practical to the deicing area designed to minimize dilution from other sources of storm water or the infiltration of groundwater.

Identifies a sampling location in each of the dedicated collection systems located as close as practical to the deicing area designed to minimize dilution from other sources of storm water or the infiltration of groundwater.

Implements BMPs for the management of glycol contaminated snow or frozen precipitation that include both nonstructural and structural BMPs with the goal of reducing the amount of glycol discharged to the storm water system from melting snow contaminated with glycol and increasing the amount of used glycol collected and recycled.

Provides secondary containment for all aircraft deicing fluid storage facilities. These facilities shall be designed to reduce or eliminate the release of glycol to the storm sewer system.

Implements BMPs for glycol and pavement deicer (i.e. potassium acetate and sodium formate) storage, transfer, and application practices that include a glycol inventory system and glycol handling procedures for all tenants. The inventory program must include daily record keeping of the amount purchased, amount used, a routine monthly reconciliation and routine visual inspection of storage

facilities and handling equipment for drips, leaks, and spills. The BMPs must also include Standard Operating Procedures (SOPs) for reporting and responding to spills that includes basic information to be reported to RIAC and DEM (as necessary) including the amount spilled supported by inventory reconciliation.

Identifies an implementation schedule with interim milestones and a final deadline to complete full implementation of the approved plan. RIAC shall fully implement the plan upon approval by RIDEM.

- vi. During each wet weather event in which airplane deicing occurs, the permittee shall take hourly flow-weighted samples for propylene glycol over the course of the wet weather event at the approved sampling locations in the dedicated storm water collection systems. The results must be reported as a flow weighted average for the wet weather event and submitted with the DMRs (Part I.D. of the permit) and summarized in the event specific and annual reports (Part I.B.4.a.(2)-(3) of the Permit).
- b. Runway Rubber Removal Procedures. This permit does not authorize the dry weather discharge of chemicals or wastewater associated with pavement and runway de-rubberizing. The permittee shall implement BMPs that include but are not limited to; performing all runway de-rubberizing during dry weather, using environmentally sensitive products, temporarily sealing the collection system, and rinsing/washing the product of the paved surfaces directed to areas to be collected and disposed of prior to the next precipitation event.
- c. Nuisance Odor and Bacteria Growth Response. The permittee shall develop and implement procedures to identify and respond to occurrences of odors and bacteria growths at outfalls and receiving streams that may be associated with airplane and runway deicing fluids, and amend the SWPPP to include these procedures. At a minimum, the procedures shall include routine observations of storm water outfalls and the receiving streams that receive discharges of storm water associated with deicing activities for the presence of odors and bacteria growths and procedures to respond to the identified odors and bacteria growths.

Within twenty-four (24) hours of being notified by RIDEM that an odor complaint that violates state water quality standards has been received, the permittee shall perform the following:

- i. Inspect all outfalls associated with the complaint for dry weather flows and obtain samples of all dry weather discharges and analyze for propylene glycol;
- ii. Obtain instream samples at the location of the odor complaint and analyze for propylene glycol;
- iii. Inspect all storm water collection system appurtenances and deicing areas associated with the complaint for evidence of residual glycols and clean as appropriate;

Within five (5) days of receipt of laboratory analysis for the abovementioned instream samples, the permittee shall submit a report that describes the following:

- i. Dates/times complaints received,
- ii. Dates/times notified by RIDEM,
- iii. Summary of recent deicing activities and collection efforts that includes the climatic conditions, amount of deicing chemicals used and recovered, a description of the glycol management BMPs implemented, locations of observed odors, measured concentrations of glycol in the discharge and the receiving stream, remedial actions to be taken to mitigate future occurrences and recommend additional investigations, controls and amendments to the SWPPP as necessary.

If the odors are evident during a dry weather period or after the deicing season has ended and/or the dry weather discharges from storm water outfalls are found to contain detectable levels of propylene glycol, the recommendations must include a scope of work and implementation schedule to perform additional investigations of the collection system and an investigation of the potential for groundwater to be contaminated with propylene glycol and to what extent it may enter the storm drain system and contribute to the occurrences of nuisance odor conditions. The plan must also identify potential remedies that may be implemented and include an implementation schedule should the investigation indicate that groundwater contaminated with propylene glycol contributes or is responsible for nuisance odor conditions in the outfalls and the receiving waters.

The permittee shall develop and implement a plan to document the occurrence and extent of iron-fixing and/or *Sphaerotilus* bacteria growths at all outfalls that receive discharges of deicing fluids and the downstream receiving waters. The permittee shall perform this investigation annually to determine to what extent the conditions have changed and make recommendations for additional controls and amendments to the SWPPP as necessary should nuisance growths continue to occur. This plan should consider the removal of existing bacteria growth from outfalls and documenting the conditions associated with observed bacteria growths in an effort to understand contributing factors and identify measures to eliminate or reduce bacteria growth.

- d. Pesticide Management. The permittee shall develop and implement BMPs for pesticide management with the goal of reducing or eliminating the concentrations and loads of pesticides in storm water discharges to the receiving waters. Mosquito control products shall be employed in accordance with State requirements by qualified personnel.
- e. Illicit Discharge Detection and Elimination. The permittee shall develop, implement and enforce a program to detect and eliminate illicit discharges or flows into the Airport's storm drainage system and amend the SWPPP to include the following:
 - (1) The permittee shall develop a plan that effectively prohibits non-storm water discharges into the system that are not authorized under this permit or the SWPPP. The plan shall include consideration of policies, contractual agreements, or other mechanisms that include sanctions for non-compliance. Procedures shall include inspections, site visits, audits, and notification for referral to DEM for enforcement action.
 - (2) The allowable non-storm water discharges listed in Part I.A.5.c. of the Permit must be addressed if they are identified by the permittee or the Department as being significant contributors of pollutants.

- (3) The illicit discharge plan must contain procedures to identify and initially target priority areas, locate illicit discharges, locate the source of the discharge, remove illicit discharges, document actions, and evaluate impact on storm water drainage system subsequent to the removal.
- (4) The permittee must inform employees, businesses, contractors, and tenants of hazards associated with illegal discharges and improper waste disposal including, but not limited to, vehicle wash water and dry weather discharge of deicing chemicals.
- (5) Annually, the permittee shall provide an annual report certifying that all discharges have been inspected and tested for the presence of non-storm water discharges. If no flow is observed the report shall include the date of outfall inspection and a certification that no flow was observed. If flow is observed the report must include a description of the results of any test for the presence of non-storm water discharges, the methods used, and the date of any testing. The report shall include a plan and schedule for investigating and removing the source of non-storm water flows.
- (6) The plan must include catch basin and manhole inspections for illicit connections, investigation of complaints, and dry weather field screening for non-storm water flows and field tests of selected parameters as indicators of illicit discharge sources as follows:
 - i. The permittee shall develop procedures for catch basin and manhole inspections for illicit connections and non-storm water discharges. The permittee shall complete all catch basin and manhole inspections within one year of the effective date of this permit. The permittee must keep records of all inspections and corrective actions required and completed.
 - ii. The permittee shall develop procedures for dry weather surveys including field screening for non-storm water flows and field tests of selected parameters and bacteria. Dry weather surveys must be conducted no less than 72 hours after the last rain fall of 0.10 inches or more. At a minimum, all dry weather flows observed during the screening from outfalls must be collected and analyzed for temperature, conductivity, pH, propylene glycol and bacteria. It is recommended that flow measurements be conducted. In addition, visual observations must include but not be limited to the following: odors, sheen, stressed vegetation, coloration/staining, algae growth, sedimentation and/or scouring in the vicinity of the outfalls. If visual observations indicate the presence of illicit discharges additional sampling and analysis for any other parameters that may be useful in the identification of the illicit discharge must be performed as warranted. Dry weather survey results must be summarized in a table and include at a minimum, the following information: location (latitude/longitude), size and type of outfall (e.g. 15" diameter concrete pipe), flow (indicate if flowing or not, include flow rate if determined), sample results, results of other parameters if measured (e.g. temperature, conductivity, and pH), and sample analysis method (e.g. Standard Methods for the Examination of Water and Wastewater). The permittee must perform two (2) surveys annually, one to be

conducted between October 1st – March 31st and one between April 1st – September 30th.

- (7) The Plan must include development and implementation of sanitary waste handling BMPs to reduce the potential that storm water runoff will come in contact with or become contaminated by sanitary wastes associated with handling sanitary wastes from airplanes.
- f. Post-Construction Storm Water Management in New Development and Redevelopment. The permittee shall develop and implement a program to address storm water runoff from new development and redevelopment projects. The plan must address direct discharges of storm water to waters of the State in addition to the discharges to the storm drainage system. The program must ensure that controls are in place to prevent or minimize water quality impacts. The post-construction program must include:
- (1) Development and implementation of strategies which include a combination of structural methods such as detention basins, wet basins, infiltration basins and trenches, dry wells, galleys, vegetated swales and vegetated filter strips and/or non-structural BMPs.
 - (2) Procedures for site plan review to ensure that design of controls to address post-construction runoff are consistent with: The State of Rhode Island Storm Water Design and Installation Manual (as amended).
 - (3) Procedures to ensure adequate and long-term operation and maintenance of BMPs.
 - (4) Procedures to develop and implement strategies to reduce runoff volume which may include minimizing impervious areas such as roads, parking, paving or other surfaces, encouraging infiltration of non-contaminated runoff, preventing channelization, encouraging sheet flow, and where appropriate, preserving, enhancing or establishing buffers along surface water bodies and tributaries.
- g. Drainage Master Plan. The permittee shall complete a detailed drainage master plan for the entire facility within one year of the effective date of this permit. The plan shall provide the permittee with a detailed plan of the existing drainage, topography, and land use which could also be used to assess existing conditions and storm water impacts as well as to determine the impact of future development at the facility. The Drainage Master Plan must include:
- (1) Completion of all activities, including but not limited to, a summary of the review of record drawings, completion of field surveys and inspections of all structures, appurtenances, drainage swales and areas subject to storm flow for location, rim elevation, invert elevation, pipe sizes, materials of construction and condition, flow directions and need for repair or maintenance as appropriate.
 - (2) Geographical Information System (GIS) Mapping of all drainage areas and catchments, conveyances, structures, pipes, outfalls and appurtenances.
 - (3) Hydraulic/hydrologic modeling of existing conditions including all catchment areas systems using StormCAD, SWMM or a similar modeling software package in order to identify capacity problems, provide insight

into future drainage development recommendations, and identify locations requiring upgrade or maintenance. The hydraulic/hydrologic modeling of all drainage systems shall be performed for the 2, 10, 25, and 100-year storm events for Drainage Areas 1 through 13.

- (4) A flow monitoring program at outfalls and key manholes/structures to be used to verify the accuracy of the model.

h. Water Quality Monitoring. The permittee shall conduct instream water quality monitoring in order to evaluate storm water impacts on the receiving water bodies of the outfalls of the Airport's storm water drainage system. The monitoring shall commence during the first complete deicing season following permit issuance and be conducted annually thereafter and be coordinated with an outfall monitoring event during the deicing season as specified in Part I.A.1 and Part I.A.2. This monitoring will assist in determining the Airport's compliance with state water quality standards. The water quality monitoring plan shall consist of the following conditions:

- (1) *Water Quality Monitoring Events and Locations.* Instream monitoring shall be conducted at the following four (4) receiving water locations: 1. The inlet to Warwick Pond at Lake Shore Drive; 2. The outlet to Warwick Pond; 3. Buckeye Brook at West Shore Road and; 4. Old Mill Creek at Tidewater Drive. The monitoring shall be conducted during a frozen precipitation event (i.e. snow, sleet, freezing rain) during the deicing season (October 1 – March 31) at the T.F. Green Airport while aircraft deicing is occurring. This monitoring shall be coordinated with storm water outfall sampling as specified in Part I.A.1. and I.A.2. of the permit.
- (2) *Monitoring Parameters, Frequency, and Duration.* Water quality parameters monitored will include pH, temperature, conductivity, total oil and grease, dissolved oxygen (DO), running average DO saturation over a 24-hour period, BOD₅, COD, Chloride, Total Suspended Solids (TSS), BTEX, and propylene glycol. During the collection of samples a visual observation of the receiving waterbody shall be made to account for any discoloration and/or foaming and an observation to account for the presence of any nuisance odors. The frequency of monitoring will occur every four-(4) hours after the onset of the deicing event. The duration of the monitoring shall be approximately two (2) days after the onset of the storm event. The water quality monitoring schedule is summarized in the following table:

Station Type	Locations	Parameters	Approximate Frequency	Duration
Receiving Waters	Warwick Pond (Inlet) Warwick Pond (Outlet) Buckeye Brook (at West Shore Road) Old Mill Creek (at Tidewater Drive)	pH Temperature Conductivity Oil and Grease DO DO saturation BOD ₅ COD Chloride TSS BTEX Propylene Glycol	Every 4 hours	2 days

(3) *Water Quality Monitoring Results.* All results obtained from the instream water quality monitoring shall be summarized and reported in a water quality monitoring report postmarked no later than the 15th day of the third month following the end of the winter deicing season. The first report shall be due on June 15, 2006.

- i. Site Inspection. An annual site inspection must be conducted by appropriate personnel named in the SWPPP to verify that the description of potential pollutant sources is accurate, that the drainage map has been updated or otherwise modified to reflect current conditions, and controls to reduce pollutants in storm water discharges associated with industrial activity identified in the Plan are being implemented and are adequate. A tracking or follow up procedure must be used to ensure that the appropriate action has been taken in response to the inspection. Records documenting significant observations made during the site inspection must be retained as part of the SWPPP for a minimum of five (5) years.
- j. Consistency with Other Plans. Storm water management controls may reflect requirements for Spill Prevention Control and Countermeasure (SPCC) plans under Section 311 of the Clean Water Act or Best Management Practices (BMP) Programs otherwise required by a RIPDES permit and may incorporate any part of such plans into the SWPPP by reference.

C. DETECTION LIMITS

The permittee shall assure that all **wastewater** testing required by this permit, is performed in conformance with the method detection limits listed below **(the EPA method is noted for reference, other EPA approved methods found in 40 CFR Part 136 may be utilized)**. **All sludge testing required by this permit shall be in conformance with the method detection limits found in 40 CFR 503.8.** In accordance with 40 CFR Part 136, EPA approved analysis techniques, quality assurance procedures and quality control procedures shall be followed for all reports required to be submitted under the RIPDES program. These procedures are described in "Methods for the Determination of Metals in Environmental Samples" (EPA/600/4-91/010) and "Methods for Chemical Analysis of Water and Wastes" (EPA/600/4-79/020).

The report entitled "Methods for the Determination of Metals in Environmental Samples" includes a

test which must be performed in order to determine if matrix interferences are present, and a series of tests to enable reporting of sample results when interferences are identified. Each step of the series of tests becomes increasingly complex, concluding with the complete Method of Standard Additions analysis. The analysis need not continue once a result which meets the applicable quality control requirements has been obtained. Documentation of all steps conducted to identify and account for matrix interferences shall be submitted along with the monitoring reports.

If, after conducting the complete Method of Standard Additions analysis, the laboratory is unable to determine a valid result, the laboratory shall report "could not be analyzed". Documentation supporting this claim shall be submitted along with the monitoring report. If valid analytical results are repeatedly unobtainable, DEM may require that the permittee determine a method detection limit (MDL) for their effluent or sludge as outlined in 40 CFR Part 136, Appendix B.

Therefore, all sample results shall be reported as: an actual value, "could not be analyzed", less than the reagent water MDL, or less than an effluent or sludge specific MDL. The effluent or sludge specific MDL must be calculated using the methods outlined in 40 CFR Part 136, Appendix B. Samples which have been diluted to ensure that the sample concentration will be within the linear dynamic range shall not be diluted to the extent that the analyte is not detected. If this should occur the analysis shall be repeated using a lower degree of dilution.

When calculating sample averages for reporting on discharge monitoring reports (DMRs):

1. "could not be analyzed" data shall be excluded, and shall not be considered as failure to comply with the permit sampling requirements;
2. results reported as less than the MDL shall be included as values equal to the MDL, and the average shall be reported as "less than" the calculated value.

For compliance purposes, DEM will replace all data reported as less than the MDL with zeroes, provided that DEM determines that all appropriate EPA approved methods were followed. If the re-calculated average exceeds the permit limitation it will be considered a violation.

LIST OF TOXIC POLLUTANTS

The following list of toxic pollutants has been designated pursuant to Section 307(a)(1) of the Clean Water Act. The Method Detection Limits (MDLs) represent the required Rhode Island MDLs.

(Updated: March 28, 2000)

Volatiles - EPA Method 624		MDL ug/l (ppb)	Pesticides - EPA Method 608		MDL ug/l (ppb)
1V	acrolein	10.0	17P	heptachlor epoxide	0.040
2V	acrylonitrile	5.0	18P	PCB-1242	0.289
3V	benzene	1.0	19P	PCB-1254	0.298
5V	bromoform	1.0	20P	PCB-1221	0.723
6V	carbon tetrachloride	1.0	21P	PCB-1232	0.387
7V	chlorobenzene	1.0	22P	PCB-1248	0.283
8V	chlorodibromomethane	1.0	23P	PCB-1260	0.222
9V	chloroethane	1.0	24P	PCB-1016	0.494
10V	2-chloroethylvinyl ether	5.0	25P	toxaphene	1.670
11V	chloroform	1.0	Base/Neutral - EPA Method 625		MDL ug/l (ppb)
12V	dichlorobromomethane	1.0	1B	acenaphthene *	1.0
14V	1,1-dichloroethane	1.0	2B	acenaphthylene *	1.0
15V	1,2-dichloroethane	1.0	3B	anthracene *	1.0
16V	1,1-dichloroethylene	1.0	4B	benzidine	4.0
17V	1,2-dichloropropane	1.0	5B	benzo(a)anthracene *	2.0
18V	1,3-dichloropropylene	1.0	6B	benzo(a)pyrene *	2.0
19V	ethylbenzene	1.0	7B	3,4-benzofluoranthene *	1.0
20V	methyl bromide	1.0	8B	benzo(ghi)perylene *	2.0
21V	methyl chloride	1.0	9B	benzo(k)fluoranthene *	2.0
22V	methylene chloride	1.0	10B	bis(2-chloroethoxy)methane	2.0
23V	1,1,2,2-tetrachloroethane	1.0	11B	bis(2-chloroethyl)ether	1.0
24V	tetrachloroethylene	1.0	12B	bis(2-chloroisopropyl)ether	1.0
25V	toluene	1.0	13B	bis(2-ethylhexyl)phthalate	1.0
26V	1,2-trans-dichloroethylene	1.0	14B	4-bromophenyl phenyl ether	1.0
27V	1,1,1-trichloroethane	1.0	15B	butylbenzyl phthalate	1.0
28V	1,1,2-trichloroethane	1.0	16B	2-chloronaphthalene	1.0
29V	trichloroethylene	1.0	17B	4-chlorophenyl phenyl ether	1.0
31V	vinyl chloride	1.0	18B	chrysene *	1.0
Acid Compounds - EPA Method 625		MDL ug/l (ppb)	19B	dibenzo (a,h)anthracene *	2.0
1A	2-chlorophenol	1.0	20B	1,2-dichlorobenzene	1.0
2A	2,4-dichlorophenol	1.0	21B	1,3-dichlorobenzene	1.0
3A	2,4-dimethylphenol	1.0	22B	1,4-dichlorobenzene	1.0
4A	4,6-dinitro-o-cresol	1.0	23B	3,3' -dichlorobenzidine	2.0
5A	2,4-dinitrophenol	2.0	24B	diethyl phthalate	1.0
6A	2-nitrophenol	1.0	25B	dimethyl phthalate	1.0
7A	4-nitrophenol	1.0	26B	di-n-butyl phthalate	1.0
8A	p-chloro-m-cresol	2.0	27B	2,4-dinitrotoluene	2.0
9A	pentachlorophenol	1.0	28B	2,6-dinitrotoluene	2.0
10A	phenol	1.0	29B	di-n-octyl phthalate	1.0
11A	2,4,6-trichlorophenol	1.0	30B	1,2-diphenylhydrazine (as azobenzene)	1.0
Pesticides - EPA Method 608		MDL ug/l (ppb)	31B	fluoranthene *	1.0
1P	aldrin	0.059	32B	fluorene *	1.0
2P	alpha-BHC	0.058	33B	hexachlorobenzene	1.0
3P	beta-BHC	0.043	34B	hexachlorobutadiene	1.0
4P	gamma-BHC	0.048	35B	hexachlorocyclopentadiene	2.0
5P	delta-BHC	0.034	36B	hexachloroethane	1.0
6P	chlordane	0.211	37B	indeno(1,2,3-cd)pyrene *	2.0
7P	4,4' -DDT	0.251	38B	isophorone	1.0
8P	4,4' -DDE	0.049	39B	naphthalene *	1.0
9P	4,4' -DDD	0.139	40B	nitrobenzene	1.0
10P	dieldrin	0.082	41B	N-nitrosodimethylamine	1.0
11P	alpha-endosulfan	0.031	42B	N-nitrosodi-n-propylamine	1.0
12P	beta-endosulfan	0.036	43B	N-nitrosodiphenylamine	1.0
13P	endosulfan sulfate	0.109	44B	phenanthrene *	1.0
14P	endrin	0.050	45B	pyrene *	1.0
15P	endrin aldehyde	0.062	46B	1,2,4-trichlorobenzene	1.0
16P	heptachlor	0.029			

OTHER TOXIC POLLUTANTS
Updated: March 28, 2000

	MDL ug/l (ppb)
Antimony, Total	5.0 - EPA Method 200.9
Arsenic, Total	5.0 - EPA Method 206.9
Beryllium, Total	0.2 - EPA Method 210.2 ¹
Cadmium, Total	1.0 - EPA Method 200.9
Chromium, Total	5.0 - Standard Methods 18 th Ed. 3113B
Chromium, Hexavalent***	20.0 - Standard Methods 16 th Ed., 312.B
Copper, Total	20.0 - EPA Method 200.7
Lead, Total	3.0 - EPA Method 200.9
Mercury, Total	0.5 - EPA Method 245.1
Nickel, Total	10.0 - EPA Method 200.7
Selenium, Total	5.0 - EPA Method 200.9
Silver, Total	1.0 - Standard Methods 18 th Ed. 3113B
Thallium, Total	5.0 - EPA Method 200.9
Zinc, Total	20.0 - EPA Method 200.7
Asbestos	**
Cyanide, Total	10.0 - EPA Method 335.4
Phenols, Total***	50.0 - EPA Method 420.2
TCDD	**
MTBE (Methyl Tert Butyl Ether)	1.0 - EPA Method 524.2

* Polynuclear Aromatic Hydrocarbons

** No Rhode Island Department of Environmental Management (RIDEM) MDL

*** Not a priority pollutant as designated in the 1997 Water Quality Regulations (Table 5)

NOTE:

All MDLs have been established in accordance with the definition of "Detection Limits" in the RIDEM Water Quality Regulations for Water Pollution Control. Unless otherwise noted the MDLs have been determined in reagent water by the Rhode Island Department of Health, Division of Laboratories. The MDL for a given analyte may vary with the type of sample. MDLs which are determined in reagent water may be lower than those determined in wastewater due to fewer matrix interferences. Wastewater is variable in composition and may therefore contain substances (interferents) that could affect MDLs for some analytes of interest. Variability in instrument performance can also lead to inconsistencies in determinations of MDLs.

¹Method detection limits for these metals analyses were determined by the USEPA. They are not contrived values and should be obtainable with any satisfactory atomic absorption spectrophotometer. To insure valid data the analyst must analyze for matrix interference effects and if detected treat accordingly using either successive dilution matrix modification or method of Standard Additions (Methods for Chemical Analysis of Water and Wastes EPA-600/4-79/020).

To help verify the absence of matrix or chemical interference the analyst is required to complete specific quality control procedures. For the metals analyses listed above the analyst must withdraw from the sample two equal aliquots; to one aliquot add a known amount of analyte, and then dilute both to the same volume and analyze. The unspiked aliquot multiplied by the dilution factor should be compared to the original. Agreement of the results within 10% indicates the absence of interference. Comparison of the actual signal from the spiked aliquot to the expected response from the analyte in an aqueous standard should help confirm the finding from the dilution analysis. (Methods for Chemical Analysis of Water and Wastes EPA-600/4-79/020).

For Methods 624 and 625 the laboratory must on an ongoing basis, spike at least 5% of the samples from each sample site being monitored. For laboratories analyzing 1 to 20 samples per month, at least one spiked sample per month is required. The spike should be at the discharge permit limit or 1 to 5 times higher than the background concentration determined in Section 8.3.2, whichever concentration would be larger. (40 CFR Part 136 Appendix B Method 624 and 625 subparts 8.3.1 and 8.3.11).

D. MONITORING AND REPORTING

1. Monitoring

All monitoring required by this permit shall be done in accordance with sampling and analytical testing procedures specified in Federal Regulations (40 CFR Part 136).

2. Reporting

Monitoring results obtained during the previous quarter shall be summarized and reported on Discharge Monitoring Report (DMR) Forms, postmarked no later than the 15th day of the month following the completed reporting period. A copy of the analytical laboratory report, specifying analytical methods used, shall be included with each report submission. Testing shall be reported as follows:

	<u>Quarter Testing To be performed</u>	<u>Report Due No later than</u>	<u>Results Submitted on DMR for</u>
First Quarter:	January 1– March 31	April 15	March
Second Quarter:	April 1– June 30	July 15	June
Third Quarter:	July 1– September 30	October 15	September
Fourth Quarter:	October 1–December 31	January 15	December

The first report is due on April 15, 2005.

3. Signed copies of DMR Forms, and all other reports required herein, shall be submitted to:

Annie McFarland
Electronic Computer Operator
Office of Water Resources
Rhode Island Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
235 PROMENADE STREET
PROVIDENCE, RHODE ISLAND 02908

FACT SHEET

RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES) PERMIT TO DISCHARGE
TO WATERS OF THE STATE

RIPDES PERMIT NO.

RI0021598

NAME AND ADDRESS OF APPLICANT:

**Rhode Island Airport Corporation
2000 Post Road
Warwick, Rhode Island**

NAME AND ADDRESS OF FACILITY WHERE DISCHARGE OCCURS:

**T .F. Green State Airport
2000 Post Road
Warwick, Rhode Island**

RECEIVING WATER:

Unnamed Tributaries of Warwick Pond and Buckeye Brook, and
Tuscatucket Brook

CLASSIFICATION:

B (Unnamed Tributaries of Warwick Pond and Buckeye Brook), A (Tuscatucket Brook)

I. Proposed Action, Type of Facility, and Discharge Location

The above named applicant has applied to the Rhode Island Department of Environmental Management (RI DEM) for reissuance of a RIPDES Permit to obtain permit coverage for storm water discharges associated with industrial activity into the designated receiving water. The facility is engaged in the operations of a major commercial airport serving Rhode Island, southeastern Massachusetts, and Connecticut. The discharge is from eighteen (18) perimeter outfalls that receive storm water flows from the Airport storm drainage system consisting of storm drains, catch basins, underground piping, and structural storm water controls.

II. Limitations and Conditions

The effluent limitations of the permit, the monitoring requirements, and any implementation schedule (if required) may be found in the Permit.

III. **Permit Basis and Explanation of Effluent Limitation Derivation**

Introduction / Background

In 1972, the Federal Water Pollution Control Act, also referred to as the Clean Water Act (CWA), was amended to provide that the discharge of pollutants to waters of the United States from any point source is effectively prohibited unless discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) Permit. Amendments to the CWA in 1987 added Section 402(p) to the Act, which establishes a framework for regulating discharges of storm water associated with industrial activities of under the NPDES program. In 1990, EPA issued final regulations that established application requirements for storm water permits, commonly referred to as Phase I Storm Water Rules. These rules required owners or operators of specific categories of industrial facilities, which discharge storm water directly to the waters of the United States or indirectly through a separate storm sewer system via a point source conveyance, to apply for a NPDES storm water permit. As defined in the Code of Federal Regulations (40 CFR 122.2), a point source means "any discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel, or other floating craft, from which pollutants are or may be discharged...". Industrial activities at a transportation facility are defined by a federal regulations as those consisting of "portions of the facility that are either involved in vehicle maintenance (including vehicle rehabilitation, mechanical repairs, painting, fueling, and lubrication), equipment cleaning operations, airport deicing operations, or which are otherwise identified in the regulations."

The State of Rhode Island has been delegated by EPA and is authorized to issue permits under the Rhode Island Pollutant Discharge Elimination System (RIPDES) Program to cover discharges of industrial storm water. In 1993 RI DEM amended the RIPDES Regulations to include the Phase I Storm Water Rules. Rule 31(c) requires that facilities with point source discharges of storm water associated with industrial activity apply for coverage under an individual, EPA group or a general permit. Rule 31(f) established an application deadline of April 19, 1993. A re-application for an individual permit for the Airport was first submitted on August 18, 1992 and resubmitted on April 7, 1993. The application was updated to include the eleven (11) storm water outfalls at the Airport discharging storm water associated with industrial activity from the thirteen-(13) drainage areas of the Airport. The original permit, issued in April 1987, covered one outfall that primarily conveyed drainage from the apron area.

T.F. Green Airport is located in Warwick, RI. Approximate boundaries of the Airport include Airport Road to the north, Lakeshore Drive and various residential streets to the east, Warwick Industrial Drive to the south, and Post Road to the west. The site is approximately 1,093 acres. The Airport is owned by the Rhode Island Department of Transportation and operated by the Rhode Island Airport Corporation. It serves as a major commercial airport in the State and region.

RIAC has submitted a Storm Water Pollution Prevention Plan (SWPPP) that describes how storm water at the airport is managed through a variety of structural controls and management practices that reduce the amount of pollutants discharged from the site. The permit requires that RIAC develop and implement a Storm Water Pollution Prevention Plan (SWPPP) that includes storm water BMPs and management measures. The permit establishes an enforceable schedule to develop and submit amendments to the SWPPP to meet the requirements established in the permit. The following storm water management measures are currently implemented at the airport: airport storm water drainage system (storm drains, catch basins, underground piping, and outfalls described above); airfield oil/water separators; Vortechs Storm Water Treatment system serving parking lots and north ramp; airfield detention basins; airfield vegetation areas; maintenance of airfield pavement and vegetation; AST fuel farm containment dike and water treatment system; catch basin valve inserts; glycol interceptor; glycol mobile collection vehicles; and snow management plans.

When developing effluent limits for RIPDES Permits, DEM is required to consider limits based on the technology available to treat the pollutants (technology-based limits) and limits that are protective of the designated uses of the receiving water (water quality-based limits). With regard to technology-based limits, the CWA requires that all discharges at a minimum meet effluent

limitations based on the technological capability of discharges to control pollutants in their discharge. EPA has not promulgated Effluent Limitation Guidelines (ELGs) based on the effluent reduction capabilities of identified treatment methods that meet the particular technology standard being applied for specific categories of dischargers on a nation-wide basis. In August 2000 the U.S. EPA reissued the *Preliminary Data Summary-Airport Deicing Operations (Revised)*. The RI DEM has utilized this document for guidance in reviewing the Storm Water Pollution Prevention Plan (SWPPP) for the Airport, in addressing toxicity issues with aircraft and pavement deicing/anti-icing agents used by the Airport, and verifying that the Airport is using the most recent and acceptable BMPs to eliminate pollution from entering the storm water drainage system. The Preliminary Data Summary provides information about the air transportation industry and the best management practices being employed for aircraft and airfield deicing operations, as well as for the collection, containment, recovery, and treatment of wastewater containing deicing agents. EPA conducted a study of airport deicing operations to collect engineering, economic, and environmental data for use in determining whether national categorical effluent limitations guidelines and standards should be developed for this category of dischargers. A secondary purpose of this study was to provide information to permit writers, control authorities, airports, and airlines in developing pollutant control strategies for discharges from airport deicing operations.

EPA and DEM regulations require RIPDES permits to contain effluent limits more stringent than technology based limits where more stringent limits are necessary to maintain or achieve Federal or State water quality standards. The permit must limit any pollutant or pollutant parameter (conventional or non-conventional, toxic, and whole effluent toxicity) that is or may be discharged at a level that caused, has reasonable potential to cause, or contributes to an excursion above any water quality criterion. An excursion occurs if the projected or actual in stream concentrations exceed the applicable criterion.

Effluent limitations are not defined exclusively as numeric Water-Quality Based Effluent Limitations (WQBELs). To the contrary, Section 502 of the CWA defines "effluent limitations" as "any restriction established by a State or the Administrator on quantities, rates, and concentrations of ... other constituents which are discharged from point sources". Therefore, although RIPDES permits must contain conditions to ensure that water quality standards are met, DEM can use narrative conditions and best management practices to achieve this requirement. RIPDES Rule 3 defines BMPs are defined as meaning "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage."

This concept is further outlined in the EPA's *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits* guidance document. This document clearly states that it is appropriate for storm water discharge permits to "use best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary". The EPA support the use of BMP based permits since "numeric limitations for storm water permits can be very difficult to develop at this time because of the existing state of knowledge about the intermittent and variable nature of these types of discharges and their effects on receiving waters" and since the current methodologies for developing WQBELs "were designed primarily for process wastewater discharges which occur at predictable rates with predictable pollutant loadings under low flow conditions in receiving waters".

RIPDES Rule 15.01 states that each permit shall contain conditions when applicable to adopt best management practices to control or abate the discharge of pollutants when: authorized under Section 402(p) of CWA for the control of storm water discharges; numeric effluent limitations are infeasible; or the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the State and Federal Acts. The draft permit contains terms and conditions to ensure compliance with water quality standards. The permittee shall implement appropriate BMPs and SWPPP as the key strategies to assure compliance with standards.

The requirements set forth in this permit are from the State's Water Quality Regulations and the State's Regulations for the Rhode Island Pollutant Discharge Elimination System, both filed pursuant to RIGL Chapter 46-12, as amended. DEM's primary authority over the permit comes from EPA's delegation of the program in September 1984 under the Federal Clean Water Act.

The effluent monitoring requirements have been specified in accordance with RIPDES regulations as well as 40 CFR 122.41 (j), 122.44 (i), and 122.48 to yield data representative of the discharge.

The RI DEM has determined that all permit limitations are consistent with the Rhode Island Antidegradation policy.

The remaining general conditions of the permit are based on the RIPDES regulations as well as 40 CFR Parts 122 through 125 and are common to all permits. The remaining specific conditions of the permit are based on the RIPDES Regulations as well as 40 CFR Parts 122 through 125 and consist primarily of management requirements.

This permit authorizes all storm water and allowable non-storm water point source discharges as defined in the Permit to waters of the State from T.F. Green's Storm Sewer System. For the purposes of this permit, storm water includes storm water runoff and snowmelt runoff. There is no limit on the time between the snowfall and snowmelt for the purpose of including a snow melt discharge in the definition of storm water. All other discharges not included in the definition of storm water constitute non-storm water discharges. The conditions in this permit apply to all airport terminals, airline carriers, and establishments engaged in servicing, repairing, or maintaining aircraft and ground vehicles, equipment cleaning and maintenance (including vehicle and equipment rehabilitation, mechanical repairs, painting, fueling, lubrication) or deicing/anti-icing operations which conduct the above described activities (facilities generally classified as SIC Code 45).

Outfalls and Receiving Waters

There are a total of eighteen (18) perimeter outfalls at the airport property, which discharge storm water associated with industrial activity. The eighteen (18) perimeter outfalls at the airport property consist of: Outfalls 001A, 002A, 003A, 004A, 004B, 004C, 005A, 006A, 006B, 006C, 006D, 007A, 007B, 008A, 009A, 010A, 011A, 012A. Outfalls 001A, 002A, 003A, and 004A discharge to tributaries of Warwick Pond; Outfalls 004B, 004C, 005A, 006A, 006B, 006C, 006D, 007A, 007B, 008A, and 009A discharge to tributaries of Buckeye Brook, and Outfalls 010A, 011A, and 012A discharge to Tuscatusket Brook. According to Appendix B of the Rhode Island Water Quality Regulations (latest revision) Buckeye Brook and Warwick Pond have been given water use classifications of B. In accordance with the Water Quality Regulations, all freshwaters hydrologically connected by surface waters and upstream of Class B waters shall be Class B unless otherwise identified in Appendix A. Therefore, the tributaries to Warwick Pond and Buckeye Brook are also classified as Class B. These waters are designated for fish and wildlife habitat and primary and secondary contact recreational activities. They shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value. Tuscatusket Brook is designated as a Class A waterbody in accordance with Rule 8.C.(3). of the Water Quality Regulations, which states that all other fresh waters not listed in Appendix A of the Regulations shall be considered to be Class A. All streams tributary to Class A waters shall be Class A. Class A freshwaters are designated as a source of public drinking water supply, for primary and secondary contact recreational activities and for fish and wildlife habitat. They shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value. As stated by Rule 8.D.(1)(b) of the Water Quality Regulations, aesthetics for all waters shall be free from pollutants in concentrations or combinations that: i. Settle to form deposits that are unsightly, putrescent, or odorous to such a degree as to create a nuisance, or interfere with the existing or designated uses; ii. Float as debris, oil, grease, scum or other floating material attributable to wastes in amounts to such a degree as to create a nuisance or interfere with the existing or designated uses; iii. Produce odor or taste or change the color or physical, chemical or biological

conditions to such a degree as to create a nuisance or interfere with the existing or designated uses; or, iv. Result in the dominance of species of fish and wildlife to such a degree as to create a nuisance or interfere with the existing or designated uses.

The State of Rhode Island 2002 303(d) List of Impaired Waters (March 2003) was developed by the RI DEM in response to requirements of Section 303(d) of the federal Clean Water Act (CWA). The 2002 303(d) list identifies waterbodies within the State, which may not currently meet Rhode Island Water Quality Standards. This list has been compiled by DEM's Office of Water Resources (OWR) and is based upon the recently completed comprehensive assessment of water quality conditions. The 303(d) list identifies impaired waterbodies and a scheduled time frame for development of total maximum daily loads (TMDLs). As such, the 303(d) list is used to help prioritize the State's water quality monitoring and restoration planning activities. The goal of DEM's TMDL program is to develop and implement plans aimed at restoring impaired waterbodies to an acceptable condition that meets water quality standards and support their designated uses (e.g., fishable and swimmable). The 2002 303(d) list uses five groups to describe the appropriate place in the TMDL process for each waterbody. Tuscatucket Brook was classified as being in Group 1 due to pathogens; Warwick Pond was classified as Group 2 due to excess algal growth, low dissolved oxygen (DO), and phosphorus; and Buckeye Brook was classified as Group 2 due to biodiversity impacts. A Group 1 waterbody is not meeting Rhode Island Water Quality Standards and TMDL development is currently underway, while a Group 2 waterbody is not meeting Rhode Island Water Quality Standards and TMDL development is planned for the future.

Deicing/Anti-Icing

For the purposes of this permit, the term "deicing" is defined as the process to remove frost, snow, or ice and "anti-icing" is the process which prevents the accumulation of frost, snow, or ice. Both of these activities are covered by this permit.

Propylene and ethylene glycol are the deicing compounds most commonly used at airports. Environmental impacts associated with the discharge of propylene glycol to surface waters include: reduction in dissolved oxygen (DO) levels, aquatic life toxicity, offensive odors and the growth of nuisance bacteria. Deicing/anti-icing operations may be performed at T.F. Green Airport from October through May. A variety of deicing agents are applied to aircraft, runways, and taxiways during frozen precipitation events and during freezing or near-freezing weather conditions. Propylene glycol is used at T.F. Green for aircraft deicing, while sodium formate and potassium acetate are applied to runway surfaces. Sodium formate has replaced solid urea, while potassium acetate has replaced liquid glycol pavement anti-icing/deicing products at the airport. Propylene glycol has replaced ethylene glycol as an anti-icing/deicing agent at the airport. The use of ethylene glycol as an anti-icing or deicing agent has been discontinued at the airport since 1992.

Dissolved Oxygen

The RI Water Quality Regulations set a DO criteria for the receiving waters of not less than 60% saturation, based on daily average, and an instantaneous minimum concentration of at least 5.0 mg/l and a 7 day mean water column DO of not less than 6.0 mg/l. The RIDEM Division of Fish and Wildlife has classified Warwick Pond, Buckeye Brook, and Tuscatucket Brook as Warm Water Fish Habitat.

Propylene glycol readily degrades in the aquatic environment and exhibits a high BOD₅. Typically, the majority of significant deicing/anti-icing operations at TF Green occur from December through March during the period of time when stream temperatures are coldest. Deicing/anti-icing operations may occur as early as October and as late as May. Although low dissolved oxygen (DO) levels are less likely to occur during the coldest period of the deicing season, as the season ends and temperatures rise, airports are still conducting operations. In addition, the snow dump piles containing deicing agents melt as temperatures rise and drain to the site drainage system, as well as to the receiving waters.

Two models were developed to evaluate the relative benefits that may result under different levels of deicing controls. The first model evaluation was performed in July 2001 by Limno-Tech, Inc on behalf of RIAC. A dissolved oxygen mass balance model was developed for Warwick Pond. The model was configured to represent glycol fate and transport and dissolved oxygen processes in Warwick Pond related to deicing events. The second modeling evaluation performed by Limno-Tech in July 2001 on behalf of RIAC was the EPA-supported WASP5 model which was applied to the Buckeye Brook/Old Mill Creek study area. The WASP5 model is dynamic and has capabilities to simulate the time and space scales important in Buckeye Brook and Old Mill Creek. Following development and calibration these models were applied to assess the relative benefits of various levels of deicing controls. BOD loadings from the Airport outfalls were reduced based on assumptions specific to each deicing control mechanism. The models were only developed to evaluate the benefits of additional controls and were not designed by RIAC's consultant or approved by RIDEM to accurately estimate or be a predictive tool of the precise DO concentrations or impacts to percent saturation in the receiving waters.

For the 1999-2000 and 2000-2001 deicing seasons RIAC conducted a winter glycol monitoring program at various storm water outfalls and downstream locations. Below is a summary of these studies.

1999-2000 Glycol monitoring program:

Prior to the 1999-2000 deicing season a pilot evaluation program was developed for glycol collection at T.F. Green Airport. The program specified record keeping requirements for airport tenants and operations staff as well as a water quality monitoring program designed to document water quality impacts caused by deicing operations. The water quality monitoring program was developed to provide data adequate to evaluate downstream impacts so that a collection program and supporting infrastructure could be designed to comply with RI WQ Regulations. BMPs selected for the glycol management program included the installation of catch basin inserts in catch basins located in the primary deicing areas on the Airport's terminal and cargo ramps, the use of Mobile Collection Unit's (MCUs) to collect glycol at the points of application, and an interceptor to collect recyclable glycol draining from the primary deicing sites that were not trapped by the storm drain inserts. On behalf of RIAC, the consultant's stated findings from the pilot investigation were as follows:

- i. Water quality in receiving waters downstream of the airport met RI water quality standards during the two events monitored during the 1999-2000 winter. There was a lack of data due to the unusually mild winter with little snowfall and as a result, the data was inadequate to draw any comprehensive conclusions.
- ii. The interceptor's performance was monitored during one event in January 2000. It was located to collect storm water from the terminal apron. During that one event it operated it collected about 40% of the glycol applied on the terminal apron.
- iii. The Mobile Collection Unit's (MCUs) performance was monitored during one event in February 2000. It was operated primarily on the terminal ramp. During that one event, it collected about 20% of the glycol applied on the ramp.

There were two monitoring events performed on January 20-23, 2000 and February 18-20, 2000 reported in the 1999-2000 report. For the first event, the report states that all DO concentrations were at or above the Water Quality Standard of 5 mg/l except for one 2.7 mg/l measurement observed at Warwick Pond Inlet and all 24-hr running average % DO saturation values were greater than the Water Quality standard minimum of 60%. The report states that low instream DO value of 2.7 mg/L value was detected at Warwick Pond Inlet 28.5 hrs into the event. The report further states that this low reading occurred prior to the observed peak BOD concentrations at Outfall 002, and appears to be unrelated to deicing discharges. A peak CBOD5 concentration in the discharge from the Outfall 8 was reported as 590mg/l and 67 mg/l for receiving water samples. The peak propylene glycol screening concentrations (converted from Brix measurements) were 6,676 mg/l at Outfall 8 and 16,466 mg/l in the receiving water samples.

For the second event, the report states that all DO concentrations were at or above the Water Quality Standard of 5 mg/ and all 24-hr running average % DO saturation values were greater

than the Water Quality standard minimum of 60%. A peak CBOD5 concentration in the discharge from the Outfall 8 was reported as 27,000 mg/l and 1,500 mg/l for receiving water samples. The peak propylene glycol screening concentrations (converted from Brix measurements) was 47,976 mg/l at Outfall 8 and 41,126 mg/l in the receiving water samples.

The report states that the findings are based upon a limited amount of data. Although the reports findings state that water quality in receiving waters downstream of the airport met RI water quality standards during the two events monitored during the 1999-2000 winter it also states that there was a lack of data due to the unusually mild winter with little snowfall and as a result, the data was inadequate to draw any comprehensive conclusions. Although the report states that the low instream DO value of 2.7 mg/L value was detected at Warwick Pond Inlet 28.5 hrs into the event. and that this low reading occurred prior to the observed peak BOD concentrations at Outfall 002, RIDEM does not agree with the conclusion that the low DO value appears to be unrelated to deicing discharges. The monitoring efforts did not include as frequent monitoring of Outfall 3 which has since been determined to be a significant source of discharges associated with airplane deicing activities. Outfall 2 was monitored with autosamplers at five minute intervals over two days while Outfall 3 was sampled only 4 times per day. Subsequent studies performed and submitted on behalf of RIAC indicate that Outfall 3 can discharge significant concentrations of propylene glycol. RIDEM agrees that the data was inadequate to draw any comprehensive conclusions.

2000-2001 Glycol monitoring program:

The glycol collection program was operated a second year of a pilot program during the 2000-2001 deicing season. A second MCU was purchased and operated because the first year's operations demonstrated that a second MCU was required to adequately cover airport-wide deicing operations. Both MCUs were operated on a total of 20 days during the deicing season from December 2000 through March 2001. The MCUs had an overall collection efficiency on operating days of approximately 36 percent at the passenger ramp, and a collection rate of 16 percent when calculated over the entire airport and during the entire deicing season. The glycol interceptor was operated whenever the MCUs were operating. The primary objective of the collection program during the season was to collect data to demonstrate the effectiveness of the BMP approach and determine what levels of controls and supporting infrastructure would be required to meet the project goals. During this season storm water outfalls from the airport were monitored during three deicing events for analysis along with glycol application and collection records. The reports conclusions from the 2000-2001 monitoring program include the following:

- i. Applicable state water quality standards for dissolved oxygen (DO) were largely met during the three monitored events with partial implementation of the full program's deicing controls and recovery equipment. Two isolated DO concentrations below 5 mg/L at the inlet to Warwick Pond were believed to be the results of erroneous readings due to shallow conditions and loose sediment or other transient conditions unrelated to deicing activities.
- ii. The majority of deicing fluid loadings occurred in the drainage areas for Outfall 002A and 008A. This confirmed that targeted control efforts in these drainage areas is appropriate.
- iii. The observed collection efficiency of 36% for the MCUs at the passenger ramp is consistent with operations at other airports.
- iv. Monitoring data at the oil/water separator in the airfield indicate that glycol concentrations at this location are often an order of magnitude higher than at Outfall 008A. This finding confirms the appropriate placement of the interceptor.

In the report, RIACs consultant concludes that applicable state water quality standards appear to have been largely met. The exceptions are contributed to human error in the sampling, a transient condition that may not be related to the airport's discharges, and the impact of sources other than discharges from the airport. The report also concludes that nearly all of the deicer loading occurs in the drainage areas for Outfalls 2 and 8 and recommends targeting control efforts on these two drainage areas.

Based on a review of the in-stream water quality monitoring, RIDEM has concerns related to the impact to dissolved oxygen and the % saturation of the receiving waters. During the February 5-7th monitoring event, the DO concentration at Warwick Pond Inlet was 0.03 mg/L at 8.7 hours into the event and 3.8 mg/L at 38.5 hours into the event. Also, the running average DO saturation over 24 hours was 48.3% at Warwick Pond Inlet. The report stated that the low DO concentrations were a result of instrument/sampling error due to possibly lowering of the DO probe into surface sediments due to low lighting conditions. However, upon comparison of Figure A20 from the monitoring report which identifies DO concentrations over time at Warwick Pond Inlet and Figures A14 and A15, which indicate CBOD₅ and COD concentrations over time at Outfall 2, peak discharges of CBOD₅ and COD occurred at times in the storm event in close proximity to times where low DO measurements were obtained. From the trending of the data and the times of the measurements for DO, CBOD₅, and COD it can be concluded that there is an interrelation between the DO and %DO saturation violations of water quality criteria and the significant peaks in the discharge of propylene glycol, measured as CBOD₅ and COD. During the February 22-24th monitoring event, there were four consecutive low DO concentrations at Outfall 3 between 22 and 41.5 hours into the event. Also, the running average DO saturation over 24 hours was 55.2% at Warwick Pond Outlet. Upon comparison of Figure A29 of the report which shows the DO concentrations over time at Outfall 3 and Figures A25 and A27 of the report which show CBOD₅ and COD concentrations over time at Outfall 3, it appears that peak discharges of CBOD₅ and COD occurred at a time when the low instream DO readings were observed. From the trending of the data and the times of the measurements for DO, CBOD₅, and COD it can be concluded that there is an interrelation between the low DO values and the significant peaks in the discharge of propylene glycol, measured as CBOD₅ and COD. Also, the high peak CBOD₅ and COD concentrations at Outfall 8 as seen in Figures A25 and A27 can be attributed to the low %DO saturation value calculated for Warwick Pond Outlet due to the high oxygen demand of propylene glycol in the environment.

In addition to the oxygen consumption associated with the degradation of propylene glycol, deicing compounds may contain nutrients that lead to excessive algae growths and cause hypoxia or instances of low DO. RIAC has also prohibited the use of Urea as a pavement deicer which can also be a source of nutrients. In a report performed by Limno-Tech, Inc. and submitted by RIAC in May 2001 it was determined that runoff from aircraft deicing activities at T.F. Green did not represent a significant concern in terms of nutrient loading. Based on an estimated maximum total season usage of Type I and IV deicing fluids total seasonal loads of less than 0.15 kg of phosphorus as P and 2.0 kg of nitrate as NO₃ were estimated as being produced from all aircraft deicing activities. Also, due to glycol collection BMPs and transport losses less than the estimated amounts would reach the storm water discharge outfalls at the Airport.

Aquatic Toxicity

The RI Water Quality Regulations do not establish a numeric Ambient Water Quality Criteria for propylene glycol for the protection of aquatic organisms from acute and chronic effects. However, the Regulations do have a narrative criteria of "none in such concentrations that could be harmful to humans or fish and wildlife for the most sensitive and governing water class use, or unfavorably alter the biota, or which would make the waters unsafe or unsuitable for fish and wildlife or their propagation, impair the palatability of same, or impair waters for any other existing or designated use".

According to the *Preliminary Data Summary Report*, the toxicity exhibited by aircraft deicing/anti-icing fluids (ADFs) is due in part to the presence of glycols (which typically make up approximately 45% to 65% of the total fluid by weight when applied), but is also due to the additives contained in the fluids. ADFs typically consist of ethylene/propylene glycol, water, surfactants (wetting agents), corrosion inhibitors (including flame retardants), pH buffers, dyes, 1,4-dioxane, and complex polymers. The chemical additives contribute significantly to the overall toxicity of ADFs and test results indicate that the formulated fluids are more toxic than pure glycol substances. Deicing fluids are composed mostly of glycol and water while the remaining additives comprise approximately 1% or less of Type I fluids and 2% or less of Type II/IV fluids. T.F. Green uses mainly Type I and Type IV propylene glycol formulated fluids for its aircraft deicing/anti-icing operations. During most deicing events, typically greater than 90% of the total

amount of deicer used is Type I. Type I fluids are dyed orange and as applied on aircraft contain between 30 and 60% glycol (typically ~ 50%), whereas Type IV fluids are dyed green and contain higher percentages of glycol, closer to 65%.

RIDEM has performed a review of literature data from several sources including EPA's *Preliminary Data Summary Report* and studies performed at other airports. RIDEM compiled results of acute aquatic toxicity testing (48 and 96-hour LC₅₀ concentrations) performed on Type I formulated fluids for species typically used to evaluate aquatic toxicity of discharges to freshwater *Pimephales promelas* (Fathead Minnow) and *Ceriodaphnia dubia* (Water Flea). The following is a summary list of the results:

Source	Species	Duration and Endpoint	Concentration of Propylene Glycol (mg/l)	Ref.
1	Fathead Minnow	96-h LC50	4,900	A
1	Fathead Minnow	48-h LC50	790	B
2	Fathead Minnow	96-h LC50	1,716	C
3	Fathead Minnow	48-h or 96-h LC50	1,450	
3	Fathead Minnow	48-h or 96-h LC50	930	
1	<i>Ceriodaphnia dubia</i>	48-h LC50	1,020	B
2	<i>Ceriodaphnia dubia</i>	48-h LC50	3,829	C
3	<i>Ceriodaphnia dubia</i>	48-h or 96-h LC50	2,770	
3	<i>Ceriodaphnia dubia</i>	48-h or 96-h LC50	4,330	
1	<i>Ceriodaphnia dubia</i>	48-h LC50	4,192	D

Source 1: "US EPA, Preliminary Data Summary, Airport Deicing Operations (Revised)"; August 2000, EPA-821-R-00-016; Table 9-4: Acute Toxicity Data for Type I and II Formulated Fluids.

Source 2: "US EPA, Preliminary Data Summary, Airport Deicing Operations (Revised)"; August 2000, EPA-821-R-00-016; Table 9-6: Aquatic Toxicity Results for Formulated Fluids and Their Components.

Source 3: Steven R. Corsi, David W. Hall, and Steven W. Geis. "Aircraft and Runway Deicers at General Mitchell International Airport, Milwaukee, Wisconsin, USA. 2. Toxicity of Aircraft and Runway Deicers." *Environmental Toxicology and Chemistry*, February 2001. Table 2: Acute and chronic toxicity test results for propylene glycol-based type I deicer.

Reference A: Ward, T. *Comparative Acute Toxicity of Type I and Type II Deicing and Antiicing Fluids to Freshwater and Marine Fish, Invertebrates, and Algae*. Prepared for ARCO Chemical Company, 1994.

Reference B: Pillard, D.A. "Comparative Toxicity of Formulated Glycol Deicers and Pure Ethylene and Propylene Glycol to *Ceriodaphnia Dubia* and *Pimephales Promelas*." *Environmental Toxicology and Chemistry*, Volume 14, 1995.

Reference C: Cancilla, D. et al. *Isolation and Characterization of Microtox-Active Components from Aircraft Deicing/Anti-icing Fluids*. *Environmental Toxicology and Chemistry*, Volume 16(3), 1997 (DCN T10467).

Reference D: Beak Consultants. *Chemical Substance Testing Final Study Reports*. Prepared for Miller Thomson, Barristers & Solicitors, 1995a-h.

In most cases, the studies either did not identify the specific product being tested or the test results were several years old. Each manufacturer uses different additives in the formulated fluids and the formulated fluids have been reformulated over time. Therefore, the RIDEM compiled bioassay results performed by the manufacturer and supplied by RIAC for the formulated Type I deicers currently in use at TF Green.

Species	Duration and Endpoint	Lyondell Product	Octagon Product
<i>Daphnia Magna</i>	48-h LC50	5,280 mg/l	19,184 mg/l
Fathead Minnow	96-h LC50	3,344 mg/l	6,160 mg/l

These results demonstrate that the Fathead Minnow is the more sensitive species tested and that the Lyondell Product exhibits aquatic toxicity at lower concentrations.

Pavement and runway deicing and anti-icing agents approved by the FAA include urea, ethylene glycol, potassium acetate, calcium magnesium acetate (CMA), sodium acetate, and sodium formate. Due to negative environmental impacts from urea and/or glycols, many airports including T.F. Green currently use more environmentally benign agents, such as potassium acetate and sodium formate. Corrosion inhibitors are often added to runway deicers to meet the Society of Automotive Engineers (SAE) and United States military specifications (MIL-SPEC). Potassium acetate is currently the most commonly used runway and pavement deicer and is typically applied in its liquid form.

Nuisance Odors

The Rhode Island Water Quality (RIWQ) Regulations state that “all waters shall be free from pollution in concentrations or combinations that ... produce odor ... to such a degree as to create a nuisance, or interfere with the existing or designated uses. The RIWQ Regulations also establish class-specific criteria for fresh waters for water bodies designated as Class B as “None in such concentrations that would impair any usages specifically assigned to this class nor cause taste or odor in edible portions of fish.”

Fresh propylene glycol has a “sweet” odor. Degradation of propylene glycol creates n-Propyl Aldehyde which produces a strong “onion-like” odor. Mercaptans and sulfide compounds are breakdown products associated with propylene glycol and can cause offensive odors. Relatively low concentrations of glycol degrading in anaerobic conditions and the presence of sulfur can cause odors. In 2001, 2003, and 2004 nuisance odors have been documented at the storm water outfalls serving areas where deicing occurs and in the receiving waters downstream of T.F. Green Airport.

In response to complaints received from personnel at the TF Green Air Traffic Control Tower, the Department of Health and Human Services, Federal Occupational Health Services, performed a survey from March 9 –14, 2001 for the Federal Aviation Administration (FAA). The final report entitled “Air and Water Survey Report” states that odors were first documented and investigated in 1991. After completing inspections and air and water sampling the report concludes that a more thorough study is needed that will address the sources of the run-off water into the brook and identify from those sources the chemicals in the water and the possible reactions between those chemicals as well as between the chemicals and the environment.” The report also states that “Since the offending odor appears all year round, it is doubtful that its origin is totally dependant on the glycol-based deicing fluid used on aircraft during the winter, unless the deicing fluid produces chemical reactions in the environment that extend well beyond the period glycol is introduced.”

From January to August 2001, the RIDEM Office of Compliance and Inspection (OCI) received and investigated numerous complaints of odors in the vicinity of T.F. Green. From January to April 2001 consultants for RIAC investigated the potential source of the odors at the airport. The investigations are summarized in the report entitled “2000-2001 Dry Weather Monitoring Report for the TF Green Airport” dated June 7, 2001. All sampling was conducted during periods of dry weather. Nuisance odors were reported by others or observed by the sampling teams when outfall concentrations ranged from 10 to 320 mg/L. The investigation also documented that foaming occurred at Outfall 8. Both inspection reports from OCI inspectors and the study performed by RIAC’s consultants conclude that based on their observations of the type of odors (sweet and onion-like smells), the time of year (winter deicing season), the location of odors at storm water outfalls serving drainage areas where deicing occurs, and other observations such as foaming in the receiving waters, that the most likely source of these odors is the discharge of propylene glycol from RIAC’s storm water outfalls.

In February and April of 2003, the RIDEM’s OCI received and investigated additional complaints of nuisance odors related to discharges from RIAC’s storm water outfalls #002 and #008 which serve the drainage areas where most of the deicing activities take place. The inspections documented odors at both outfalls and in the receiving waters as well as noticeable foaming in the receiving waters. Samples were taken by RIDEM at outfalls #002 and #008 and at multiple instream locations. Discharge concentrations from outfalls #002 and #008 were 24 mg/l and 420

mg/l respectively. Instream concentrations of propylene glycol at locations where odors were detected were 36 mg/l at Lakeshore Drive and 24 mg/l at Old Warwick Avenue.

In February of 2004, RIDEM performed additional investigations related to nuisance odors. On February 5, 2004 RIDEM obtained in-stream samples at six locations. Odors were detected at the stream crossing at Lake Shore Drive prior to entering Warwick Pond, at the stream 60 feet south of Stillwater Drive, at the stream crossing at Old Warwick Avenue, with instream concentrations of propylene glycol of 26 mg/l, <10mg/l, and 10 mg/l respectively. Outfall discharges were not sampled due to a lack of approved access to RIAC property.

Logan International Airport in Massachusetts has experienced nuisance odor conditions due to glycol contaminated groundwater. For several years, there had been an odor problem at the terminus of the Ted Williams Tunnel particularly during the winter season. The odor was most noticeable in the days following significant precipitation, either rain or snow and appeared to be related to the storm drainage system. Strong "onion-like" odors were attributed to the biodegradation of glycol deicing compounds used at the airport. The Massachusetts Port Authority's Environmental Management Unit (Massport) contracted a consulting firm to design a pilot study to evaluate bioremediation technology using microbes to remediate glycols. The consultant pilot tested anaerobic and aerobic (with and without the addition of bacteria and or nutrients) bioremediation to eliminate odors. The study utilized storm water runoff from the airports drainage system spiked with concentrations of Propylene Glycol ranging from 330 to 580 mg/l. It was noted that even the lowest concentration tested (300 mg/L of glycol) produced strong odors under the test conditions.

Nuisance Bacteria

The RI WQ Regulations establish a narrative Water Quality Criteria for nutrients of "none in such concentration that would impair any usages specifically assigned to said Class, or cause undesirable or nuisance aquatic species associated with cultural eutrophication ..."

Investigations performed by RIDEM and RIAC (report entitled " 2000-2001 Dry Weather Monitoring Report for the TF Green Airport" dated June 7, 2001) have documented growths of iron-fixing and *Sphaerotilus* bacteria at RIAC's Storm Water outfalls #002 and #008. These growths can be linked to an excessive supply of carbonaceous nutrients. Studies of storm water discharges from airports where deicing occurs often link these growths to discharges of glycols and low DO conditions. Propylene glycol provides a high carbon source of food, which can fuel extensive growths of *Sphaerotilus* bacteria. *Sphaerotilus* bacteria has been documented to cover entire stream beds, crowding out indigenous forms of aquatic life. Decaying *Sphaerotilus* can consume DO and produce hydrogen sulfide creating nuisance odors.

In 1993, the Kentucky Department of Environmental Protection, Division of Water, (KDOW) performed a stream study on Elijah's Creek that found that the stream had been severely impacted by discharges of deicing fluids from the Cincinnati/Northern Kentucky International Airport. In 1998 the KDOW issued a Total Maximum Daily Load (TMDL) for deicing fluids that did not establish a numerical limit for deicing fluids whereby nuisance growths are avoided but stated that implementation of the numerical limits established to meet other water quality criteria and eliminate other environmental impacts such as DO and toxicity should be protective.

Foaming

The RI WQ Regulations establish a narrative criteria for foam of "none allowable". Investigations performed by RIDEM OCI and RIAC consultants (report entitled " 2000-2001 Dry Weather Monitoring Report for the TF Green Airport" dated June 7, 2001) have documented foaming from outfalls #002 & #008 as well as downstream locations in Buckeye Brook. Airplane deicing chemicals (commonly referred to as ADFs) are known to contain additives including surfactants. The permit contains a condition that states that " The effluent shall contain neither a visible oil sheen, foam, nor floating solids at any time".

Permit Requirements

The permit requires a best management practice (BMP) approach for a glycol management. A storm water BMP is defined as any program, technology, process, citing criteria, operating method, measure or devices which controls, removes or reduces pollution. Based upon the factors cited above, the permit requires that RIAC develop and implement a Storm Water Pollution Prevention Plan that includes BMPs to promote source reduction and pollution prevention and to be protective of water quality standards and criteria in the receiving waters such as dissolved oxygen and percent saturation, aquatic toxicity, foaming, nuisance odors, and nuisance bacteria growths. The permit requires the development of BMPs to minimize the amount of fluids applied to aircraft, minimize contact and dilution with storm water, prevent releases from accidental spills or leaks, minimize releases from melting deicer contaminated snow, and the use of available technology and controls that collect and dispose of contaminated storm water and prevents the dry weather discharge of deicing fluids. The permit requires dedicated drainage systems for each area where deicing occurs designed to minimize dilution from storm water. Each drainage system is required to have automated controls to detect and divert concentrations of glycol greater than 1% or 10,000 ppm at a downstream location in the dedicated collection system. RIDEM has determined that automated controls are necessary because catch basin inserts that collect deicing fluids during dry weather must be opened during wet weather events to prevent flooding and efforts to collect fluids prior to entering the system during wet weather is dependant on manpower, storage capacities and timely access to application areas. Also, at these locations, the permit requires hourly flow-weighted sampling for propylene glycol and establishes a benchmark value of .33% or 3,300 ppm. Annually, the permittee must compare the average annual results to the bench mark value. If the annual average exceeds the benchmark value, the permittee must evaluate the effectiveness of the SWPPP and BMPs and make recommendations for enhanced BMPs and submit the revised SWPPP to DEM for review and approval.

The permit includes a condition that RIAC prohibit the use of any ADF more toxic than those currently in use defined as determined by bioassay testing using the results of an LC50 96 h test on *Pimephales promelas* expressed as Propylene Glycol.

The permit does not authorize the use of Urea or Glycols for runway or pavement deicing and requires RIAC to implement runway and pavement deicing BMPs that include pollution prevention such as choosing environmentally sensitive products and source reduction BMPs such as anti-icing techniques. The proposed BMPs when implemented will meet the narrative criteria of "no toxics in toxic amounts".

The permit requires that the SWPPP include BMPs, as previously discussed, intended to reduce the potential for the creation of nuisance odors. The permit requires the permittee develop and implement procedures to identify and respond to occurrences of nuisance odors in the discharges and receiving streams associated with airplane and runway deicing, and investigate the potential for groundwater to be contaminated with propylene glycol and to what extent it may enter the storm drain system and contribute to the occurrences of nuisance odor conditions. The permit also establishes deadlines for the permittee to respond to notification of odor conditions with outfall and instream sampling for propylene glycol and to perform inspections of all associated collections system appurtenances for residual glycols. The permit also contains a condition that will require the permittee to investigate groundwater as a potential source of residual propylene glycol if odors are documented during dry weather, dry weather discharges from the outfalls are found to contain detectable concentrations of propylene glycol, or if odors persist after the deicing season has ended.

The permit contains a condition that requires that RIAC observe the receiving waters for nuisance bacteria and should nuisance growths of *Sphaerotilus* continue to occur, that other control mechanisms will be applied as necessary. The permit requires that within seven (7) days of identifying a nuisance odor condition or being notified by RIDEM that a nuisance odor condition has occurred, the permittee shall submit a report that describes the climatic conditions, amount of deicing chemicals used and recovered, a description of the glycol management BMPs implemented, locations of observed odors, measured concentrations of glycol in the discharge

and the receiving stream, remedial actions to be taken to mitigate future occurrences and recommend additional controls and amendments to the SWPPP as necessary should nuisance growths continue to occur.

The permit requires RIAC to measure surfactants in the outfalls that serve drainage areas where deicing occurs and requires the implementation of BMPs and a Glycol Collection and Management Plan that reduces the potential for foaming caused by the discharge of deicing chemicals.

Fueling/Refueling/Fuel Storage/Glycol Storage and Maintenance Activities

Portions of discharges from perimeter outfalls designated 001A, 002A, 003A and 008A receive treatment from oil/water separators due to the nature of activities taking place in the corresponding drainage/sub-drainage basins (i.e., fueling, fuel storage) and the potential for VOCs/SVOCs to be present in the respective discharges. These outfalls must be sampled four (4) times per year to closely monitor the effectiveness of the oil/water separators. Discharges from the remaining perimeter outfalls must be sampled semiannually or annually.

The effluent limitations for oil and grease are based on American Petroleum Institute (API) oil/ water separator guidelines.

Discharges from two (2) interior outfalls designated 100A and 200A (planned outfall as of the effective date of this permit) are processed by a treatment system or will be retained by a containment structure, respectively, prior to discharge. Discharges from these outfalls must be sampled on a specified schedule (100A) or prior to any discharge while fluids are stored within the containment structure (200A).

Outfall 100A is located within Drainage Area 13 of the airport property, which contains the airport's primary fuel farm (Northstar West Tank Farm). The West Tank Farm consists of a newly constructed aboveground storage tank (AST) farm and fueling facility. The AST fuel farm is fully operational and has replaced the former UST fuel farm which was removed as part of the airport's UST compliance program. The tank farm consists of six AST's, a concrete containment dike, a truck transfer pad, and a water treatment system. The replacement AST fuel farm is located immediately east of the former UST fuel farm and is designed to fully comply with all SPCC requirements per 40 CFR 112. The AST fuel farm includes four (4) 50,000-gallon Jet A tanks and two (2) 10,000-gallon tanks containing AV Gas and gasoline. The AST's and aboveground piping are located within an impervious concrete containment dike designed to provide approximately 86,000 gallons of secondary containment volume. Product releases are contained within sub-containment areas inside the dike. Storm water that collects in the diked areas drains to a valve sump at the eastern end of the containment dike. The water is tested prior to being released to a holding tank and water treatment system. The treatment system consists of an activated carbon filter and pump station equipped with a flow-activated pump. Upon release of the storm water from the containment dike, the water is treated via the treatment system and pumped to the airport's storm drainage system. The AST fuel farm water treatment system results in a discharge of treated storm water to the airport's storm drainage system, which ultimately discharges from Outfall 001A to an existing storm water drainage system along Airport Road. The separate storm sewer system along Airport Road ultimately discharges into Warwick Pond, which has been given a receiving water designation of Class B. According to Rule 8.C.(2) of the State's Water Quality Regulations, "All freshwaters hydrologically connected by surface waters and upstream of Class B, B1, SB, SB1, C or SC waters shall be Class B unless otherwise identified in Appendix A of these regulations."

The effluent discharge limitations for Outfall 100A are consistent with those for Class B receiving waters with a dilution factor greater than ten (10), as shown in Part I.B.4. of the RIPDES General Permit for Discharges Associated with the Treatment of Groundwater Contaminated by #2 Fuel Oil (General Permit). The effluent limitations contained in the General Permit consist of either water quality based limits, technology based limits, or a combination of each. The more stringent of the two allowable discharge levels were used as the actual effluent limitation for a given pollutant. For the parameters that require monitoring, only pH, Benzene, Total BTEX, and Total

Petroleum Hydrocarbons (TPH) contain numeric effluent limitations. The remainder of the parameters are monitor only. The average monthly discharge limits for Benzene were established based on removal efficiencies achieved by conventional treatment technology commonly used in groundwater remediation projects (i.e. air stripping, GAC), consistent with the EPA guidance document entitled 'Model NPDES Permit for Discharges Resulting from the Cleanup of Gasoline Released from Underground Storage Tanks' (EPA Model Permit), published June 1989. The maximum daily discharge limits for Benzene were based on technology based limits, which were more stringent than freshwater aquatic life criteria (acute exposure). Total BTEX limits were technology based following guidance in the EPA Model Permit. The TPH limit was based on the removal efficiencies achieved by conventional treatment technology commonly used in groundwater remediation projects (i.e. air stripping, GAC). Granular activated carbon technology is proven to be able to remove VOCs and CVOCs to a concentration below 1.0 ug/L. As there are no water quality criteria or technology based limits for methyl tertiary butyl ether (MTBE) or total iron, they will be monitored only.

The effluent limitations for pH are based on criteria established in the State's Water Quality Regulations. Table 1.8.D.(2).7. – Class Specific Criteria – Fresh Waters establishes a pH (Standard Units) range of 6.5 – 9.0 or as naturally occurs for Class A, B, B1, or C Fresh Waters.

Outfall 200A is located within Drainage Area 1 of the airport property, which contains the airport and tenant facilities (i.e. hangars and fuel farms) situated at the northern edge of the airfield along Airport Road. RIAC has planned to locate a proposed recovered glycol processing system and related containment structure within the drainage area to be located adjacent to Taxiway N. Screening for the presence of propylene glycol shall be performed prior to the discharge of any accumulated storm water from the containment structure. Screening shall be performed using a refractometer having capable of reading accurately to a BRIX scale of 0-15 to a resolution of 0.1 BRIX units. If such screening indicates that a concentration of more than one (1) percent propylene glycol is present, accumulated storm water shall be collected and transported to a permitted treatment facility or reintroduced to appropriate storage tanks for the recovered glycol processing system. If screening for the presence of propylene glycol using a refractometer indicates a concentration less than or equal to one (1) percent propylene glycol, the accumulated storm water may be discharged. No discharge shall be allowed unless monitoring determines that propylene glycol is not present in accumulated storm water. Discharges of clean storm water are allowed with no monitoring only following the submittal of certification by the permittee indicating that no fluids containing propylene glycol are stored in containers or equipment within the containment structure. Monitoring shall be subsequently required for any storm water discharge following the reintroduction of fluids containing propylene glycol to containers or equipment within the containment structure. Any discharges occurring while fluids containing propylene glycol are located within the containment structure shall be limited and monitored by the permittee as specified in Part I.A.4. of the Permit.

The effluent discharge limitations and monitoring requirement for Outfall 200A were established for Flow and Propylene Glycol. These pollutants shall be monitored according to the permit requirements only if screening of the accumulated storm water from the containment structure indicates a concentration of less than one (1) percent propylene glycol. Then, once per the course of the discharge a grab sample shall be taken and analyzed for propylene glycol using EPA Method 8270 (or an approved alternative). All the effluent discharge limitations for Flow and Propylene Glycol are monitor only.

Storm Water Pollution Prevention Plan

The permit requires the implementation of the permittees existing Storm Water Pollution Prevention Plan (SWPPP) as of the effective date of the permit. The permit establishes a schedule that requires the permittee to amend the SWPPP to include additional BMPs as specified in the permit. The goal of the SWPPP is to help identify the source of pollutants in the discharge of storm water and to ensure practices are being implemented to minimize pollutants associated with industrial activities from entering any storm water discharge. This Plan emphasizes the use of Best Management Practices (BMPs) to provide the flexibility to address different sources of pollutants. The required elements of the SWPPP must be retained onsite for the duration of the authorization

to discharge. This information must be made available to the Department of Environmental Management to monitor the effectiveness of the BMPs and to ensure permit conditions are being met.

Certain required elements of the SWPPP are listed below.

- Description of Potential Pollutant Sources
- Storm Water Management Controls
- Deicing Fluid Collection and Management/Source Reduction
- Runway Rubber Removal Procedures
- Nuisance Odor and Bacteria Growth Response
- Pesticide Management
- Illicit Discharge Detection and Elimination
- Post-Construction Storm Water Management in New Development and Redevelopment
- Drainage Master Plan
- Water Quality Monitoring
- Site Inspection

Effluent Monitoring Requirements

Effluent limitations and monitoring requirements for the eighteen (18) perimeter outfalls listed above in the Outfalls and Receiving Waters section of the Fact Sheet were established so that they would be protective of the receiving water bodies to which they discharge. Chapter 8.0 (Wastewater Characterization) of the *Preliminary Data Summary Report* presented EPA sampling data taken to supplement analytical data from the industry in order to identify pollutants present in wastewater from aircraft deicing and anti-icing operations. The samples were analyzed for a large number of conventional and non-conventional pollutants. RIDEM used the Report to identify pollutants of concern and establish effluent monitoring requirements related to the use of deicing chemicals. For the perimeter outfalls designated DSN-002A, -003A, -008A, and -010A quarterly or semiannual grab samples shall be taken for the following pollutants: Flow, pH, Temperature, Oil&Grease, Total Suspended Solids (TSS), BOD₅, Propylene Glycol, COD, Potassium, Sodium, Total BTEX, MTBE, TPH, Surfactants, Dissolved Oxygen (DO), Total Organic Carbon (TOC), Fecal Coliform, and Metals (i.e. Aluminum, Arsenic, Copper, Lead, Tin, etc.). Semi-Volatile Organic Compounds (SVOCs) shall be monitored on an annual basis.

For the remainder of the perimeter outfalls effluent limitations and monitoring requirements were established for: Flow, pH, Oil & Grease, TSS, BOD₅, Fecal Coliform, Potassium, and Sodium. These pollutants shall be monitored either semiannually or annually.

The effluent limitations for pH are based on criteria established in the State's Water Quality Regulations. Table 1.8.D.(2).7. – Class Specific Criteria – Fresh Waters establishes a pH (Standard Units) range of 6.5 – 9.0 or as naturally occurs for Class A, B, B1, or C Fresh Waters.

IV. Comment Period, Hearing Requests, and Procedures for Final Decisions

All persons, including applicants, who believe any condition of the draft permit is inappropriate must raise all issues and submit all available arguments and all supporting material for their arguments in full by the close of the public comment period, to the Rhode Island Department of Environmental Management, Office of Water Resources, 235 Promenade Street, Providence, Rhode Island, 02908-5767. Any person, prior to such date, may submit a request in writing for a public hearing to consider the draft permit to the Rhode Island Department of Environmental Management. Such requests shall state the nature of the issues proposed to be raised in the hearing. A public hearing may be held after at least thirty (30) days public notice whenever the Director finds that response to this notice indicates significant public interest. In reaching a final decision on the draft permit the Director will respond to all significant comments and make these responses available to the public at DEM's Providence Office.

Following the close of the comment period, and after a public hearing, if such hearing is held, the Director will issue a final permit decision and forward a copy of the final decision to the applicant and each person who has submitted written comments or requested notice. Within thirty (30) days following the notice of the final permit decision any interested person may submit a request for a formal hearing to reconsider or contest the final decision. Requests for formal hearings must satisfy the requirements of Rule 49 of the Regulations for the Rhode Island Pollutant Discharge Elimination System.

V. **DEM Contact**

Additional information concerning the permit may be obtained between the hours of 8:30 a.m. and 4:00 p.m., Monday through Friday, excluding holidays, from:

Aaron Mello
RIPDES Program
Office of Water Resources
Department of Environmental Management
235 Promenade Street
Providence, Rhode Island 02908
Telephone: (401) 222-6820x7405

Date

Eric A. Beck, P.E.
Supervising Sanitary Engineer
RIPDES Permitting Section
Office of Water Resources
Department of Environmental Management

November 12, 2004

CERTIFIED MAIL

Mr. Mark Brewer
Executive Director
Rhode Island Airport Corporation
2000 Post Road
Warwick, RI 02886-1533

RE: T.F. Green State Airport Final Permit; RIPDES Permit No. RI0021598

Dear Mr. Brewer:

Enclosed is your final Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit issued pursuant to the referenced application. In accordance with State regulations, promulgated under Chapter 46-12 of the Rhode Island General Laws of 1956, as amended, this permit becomes effective on January 1, 2005.

Also enclosed is information relative to hearing requests and stays of RIPDES Permits along with the Department's responses to comments received during the public comment period.

We appreciate your cooperation throughout the development of this permit. Should you have any questions concerning this permit, feel free to contact Aaron Mello or Eric Beck of the RIPDES Program Staff at (401) 222-4700, extensions 7405 and 7202, respectively.

Sincerely,

Angelo S. Liberti, P.E.
Chief of Surface Water Protection

ASL:am

Enclosures

cc: EPA Permits Branch, Region 1
Frederick Vincent, Interim Director, DEM
David Chopy, DEM/OC&I
Alicia Good, DEM/OWR
Annie McFarland, DEM/OWR
Greg Schultz Esq., DEM/Legal
Brenda Pope, RIAC
Dean Audet, Fuss & O'Neill, Inc.

RESPONSE TO COMMENTS

COMMENTS WERE RECEIVED ON THE DRAFT PERMIT FOR THIS FACILITY DURING THE PUBLIC COMMENT PERIOD FROM MARCH 22, 2004 TO APRIL 27, 2004. THEREFORE, THE FOLLOWING RESPONSES WERE PREPARED:

1. CITY OF WARWICK, DATED APRIL 16, 2004:

Comment: The City of Warwick made the following group of comments regarding the draft RIPDES Permit and Fact Sheet:

"The sustainability of a high-quality habitat requires improvement in water through elimination of de-icing agents, which have high biological oxygen demand (BOD) and can be toxic to freshwater organisms. Equally critical is a reduction in the amount of heavy metals, ethers, trichloroethylene, chloride, chloroform, toluene, and methylene that enter the drainage system through runoff from taxiways, runways and maintenance facilities. These toxic pollutants require onsite mitigation prior to discharge, as well as stricter monitoring"

"The City is of the opinion that the draft permit must set higher standards for all the aforementioned and should include specific milestones for achieving improved water quality through the total elimination of discharge of glycol and other airport-based pollutants into Buckeye Brook and Warwick Pond."

"The RIPDES permit should adopt strict performance standards to reverse environmental impacts, caused by myriad airport-related discharges, through the advancement of contemporary drainage infrastructure, including pollutant monitoring and removal."

"The City of Warwick suggests that the re-issuance of the permit should contain a phase out schedule that requires the Rhode Island Airport Corporation to eliminate all glycol discharge by 2009 through the development of a closed collection deicing system. In addition, the regulations must require the upgrade of the onsite drainage system in order to mitigate an ever-greater percentage of toxic and soluble pollutants."

Response: The RI DEM believes that the effluent limitations and monitoring requirements, and all the terms and conditions of the draft RIPDES Permit for T.F. Green State Airport provide adequate protection of the environment and surrounding receiving water bodies that receive the Airport's industrial storm water discharges. The permit includes requirements that the Permittee develop and implement a Storm Water Pollution Prevention Plan (SWPPP) that includes Best Management Practices (BMPs) intended to eliminate or reduce the potential for impacts from de-icing chemicals and toxic pollutants. These BMPs include both Pollution Prevention measures and on-site mitigation or treatment of storm water discharges. The permit requires discharge and in-stream monitoring for the pollutants of concern that will be used to evaluate the efficacy of the SWPPP and BMPs. The permit establishes a deadline for the Permittee to submit a revised SWPPP and implementation schedule that requires the Permittee to evaluate alternative deicing chemicals and practices, investigate and upgrade the drainage system, and implement practices that reduce the potential of exposure of pollutants or activities to precipitation.

When developing effluent limits for RIPDES Permits, RIDEM is required to consider limits based on the technology available to treat the pollutants (technology-based limits) and limits that are protective of the designated uses of the receiving water (water quality-based limits). With regard to technology-based limits, the CWA requires that all discharges at a minimum meet effluent limitations based on the technological capability of discharges to control pollutants in their discharge. As of this date, EPA has determined it is not appropriate to promulgate Effluent Limitation Guidelines (ELGs) for Airports on a nation-wide basis. EPA's determination is documented in the August 2000 *Preliminary Data Summary-Airport Deicing Operations (Revised)*. The RIDEM has utilized this document for guidance in reviewing the Storm Water Pollution Prevention Plan (SWPPP) for the Airport, in addressing toxicity issues with aircraft and pavement deicing/anti-icing agents used by the Airport, and verifying that the Airport is using the most recent and acceptable BMPs to eliminate pollution from entering the storm water drainage system.

When considering water-quality based effluent limits, RIDEM is required to assign an effluent limitation for any pollutant that causes, has the reasonable potential to cause or contributes to an excursion above water quality criteria based on projected or actual in-stream concentrations. In performing this evaluation the RIDEM has reviewed dissolved oxygen (DO) models for Warwick Pond and Buckeye Brook/Old Mill Creek; several years of discharge and in-stream monitoring results, EPA's August 2000 *Preliminary Data Summary-Airport Deicing Operations (Revised)*, aquatic toxicity data for aircraft/pavement deicers from literature and manufacturer specifications, and summaries of investigations and monitoring conducted by RIDEM's Office of Compliance and Inspection (OCI). Based on this analysis, the permit establishes water quality based effluent limitations in the form of BMPs that address the pollutants of concern and are protective of water quality.

Part I.B.4.a.(4).v. of the Permit includes specific schedules/milestones (i.e. reducing number and size of deicing areas, implementing BMPs for the management of glycol contaminated snow, providing secondary containment for aircraft deicing fluid storage facilities, etc.) relating to aircraft/pavement deicing material usage, storage and collection that when implemented will lead to improved water quality. Post-construction storm water management in new development and redevelopment and drainage master plan requirements have been included in the Permit to assist in better planning for future development, which will ultimately lead to improved management and treatment of storm water discharges.

Therefore, the permit adequately addresses the City's concerns and no changes have been made to the draft permit.

2. GAIL ARMSTRONG, DATED APRIL 23, 2004:

Comment: Gail Armstrong, a resident of the City of Warwick, made the following comments regarding the draft RIPDES Permit and Fact Sheet:

"I was disturbed by the lack of information given residents regarding the cause of the odors or the potential impact on the environment and people. Although the propylene glycol may break down naturally in the brook, there seems to be a question about whether chemical reactions are produced which may remain in the environment longer."

"I would like to see more testing of the water quality in the pond, especially in the summer, and some procedure put in place to notify residents when there has been a spill, or when swimming is unsafe."

Response: The RIDEM has investigated the cause of the odors and has issued a Notice of Violation to the RIAC identifying discharges of deicing chemicals as the cause of nuisance odors in the receiving waters. This information is a matter of public record and is available for public review. The permit requires monitoring of storm water discharges and in-stream monitoring that will provide additional information regarding the sources of the odors and potential impacts to the environment. The permit also requires the Permittee to take actions and perform investigations to identify and address the potential sources of the odors. The permit requires the Permittee to implement measures intended to address the potential impact to the receiving waters and to protect water quality. If the monitoring or investigations determine that there is potential for an impact to human health, the RIDEM will work closely with RIDOH to define the extent of the impacts and notify the public should that become necessary.

The state has adopted water quality standards that define the water quality goals for the state's waters by deciding what their uses will be (designated uses, e.g., swimming, aquatic life, shellfishing, drinking water, etc), and setting criteria necessary to protect those uses. Within Rhode Island's Water Quality Regulations are numeric water quality criteria that represent parameter-specific thresholds for acceptable levels of substances in waters of the state. For other parameters, the standard is more descriptive (narrative) in nature (e.g. "no toxics in toxic amounts"). The ambient data collected by the various monitoring projects are compared to the water quality criteria and designated uses for each waterbody. All of this data and information is then used to arrive upon a water quality assessment and determination of water quality use support status for each waterbody.

The Standards Section of the Office of Water Resources (OWR) implements the State's Water Quality Standards Program. The Water Quality Standards Program is responsible for ensuring compliance with the Federal Clean Water Act (CWA). The purpose of this program is to restore, preserve, and enhance the water quality of Rhode Island waters, to maintain existing uses and to protect the waters from pollutants so that the waters shall, where possible, be fishable and swimmable, and be available for all designated uses and thus assure protection for the public health welfare, and the environment. These objectives are implemented through the water quality standards that are a fundamental element of the state's Water Quality Regulations. The water quality standards are developed to define water quality goals for the state's waters by deciding what their uses will be (designated uses) and by setting criteria necessary to protect those uses. According to Appendix A of the Rhode Island Water Quality Regulations, Warwick Pond is designated as a Class B surface water. Rule 8.B.(1).(b). of these Regulations define a Class B surface water as the following: "These waters are designated for fish and wildlife habitat and primary and secondary contact recreational activities. They shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value." Primary contact recreational activities include swimming, diving, water

skiing and surfing, while secondary contact recreational activities includes boating and fishing.

Section 305(b) of the Federal Clean Water Act (CWA) requires each state to assess the health of their surface waters and submit biennial reports describing the water quality conditions to the USEPA. This 305(b) process is the principal means by which states, EPA, and the public evaluate water quality and attainment of the fishable and swimmable goals of the CWA, and how well the waters support their designated uses. For the purpose of this report, assessments are made on the following individual designated uses: aquatic life, swimming, drinking water, fish consumption and shellfishing. The water quality standards were used to categorize waters as "Fully Supporting", "Fully Supporting but Threatened", "Partially Supporting" or "Not Supporting" the designated uses. Partially and Not Supporting use assessments are collectively considered "Impaired" water quality conditions. Through the 305(b) assessment process, waterbodies which are determined to be partially or not supporting any of their designated uses are considered impaired, and placed on the RI 303(d) List of Impaired Waters where they are prioritized and scheduled for restoration. The Assessment Information notes if the waterbody is on the 2002 303(d) List of Impaired Waters. The recent 305(b) Report used data from 1999 and 2000, and data collected during 2001 that were available in time for incorporation.

The Office of Water Resources' (OWR) surface water monitoring program is designed to gather statewide baseline data in addition to targeted monitoring information. The data is used in establishing and reviewing the state's water quality standards and to measure progress toward achieving the state and federal water quality goals. Current surface water monitoring programs include activities conducted by the OWR staff as well as monitoring carried out by other agencies/organizations under contracts with OWR. The surface water monitoring program consists of targeted and probability based station sites, intensive surveys, special studies, and volunteer monitoring programs. For example, OWR has contracted with the USGS to conduct riverine monitoring at select stations. Biological monitoring at 45 stream sites around the state. Twenty-five of these 45 stations are also monitored for various conventional and toxic pollutants. The OWR staff is involved in watershed monitoring projects on over 30 waterbodies. Additional monitoring activities are also conducted by many Citizens Monitoring groups. For example, the RIDEM has a contract with URI's Watershed Watch Program. The URI Watershed Watch Program works with local governments, watershed, tribal and other organizations to assess water quality by recruiting and training volunteers to become citizen scientists. Volunteers collect water quality data from lakes, in addition to streams tributary to lakes, to assist in evaluating inputs of pollutants. The Watershed Watch Program currently monitors approximately 100 lakes statewide, 8 river sites and 15 estuarine areas. Warwick Pond is one of the monitored lakes and data is available at the following website: <http://www.uri.edu/ce/wq/www/html/www.html>.

The purpose of the Rhode Island Department of Health Beach Monitoring Program is to provide real-time water quality and safety information concerning licensed bathing facilities. Results were compared with the state's water quality standards for swimming, the fecal coliform standards for Class B and Class SB waters. Through effective management of these beaches, the Department of Health can minimize public health risks associated with swimming in contaminated waters. HEALTH has the jurisdiction to close any licensed bathing area when there is a violation of Rhode Island's water quality standards for

swimming use. Please note that Warwick Pond is not listed as a licensed bathing facility as designated by the HEALTH. Therefore, since Warwick Pond is not a licensed bathing facility, residents in the area may swim at their own risk. If you would like to get more information regarding the Rhode Island Department of Health Beach Monitoring Program, or like to have Warwick Pond considered as a licensed bathing facility you may contact David Burnett at (401) 222-2750 or visit the Beach Monitoring Program at the following website:

<http://www.health.state.ri.us/environment/beaches/index.html>

Monitoring of Warwick Pond began in 1995 by the URI Watershed Watch Program. 1999 and 2000 URI Watershed Watch data was used to assess Warwick Pond for swimming and aquatic life use. Pathogen data collected met swimming criteria, and Warwick Pond is assessed as fully supporting swimming use. Total phosphorus and dissolved oxygen data violated criteria, which caused Warwick Pond to be assessed as partially supporting aquatic life use.

Because of concern raised about Buckeye Brook, the Brook has been given a priority for continued biological monitoring. The approach collects macroinvertebrates (insects) and the abundance/distribution of the species that is determined is used to gauge water quality conditions. Biological indicators are best for measuring chemical cumulative stress from pollutant loadings instream. DEM, and others, have all identified that current monitoring programs need to be enhanced. Towards this end, DEM is finalizing a new statewide monitoring for surface waters that will result in more thorough periodic monitoring of rivers and streams. Any new information will become available on the DEM website at www.state.ri.us/dem.

To address the issue of notifying residents in the event of a spill, the DEM reviewed T.F. Green Airport's existing Spill Prevention, Control, and Countermeasure Plan (SPCC Plan) dated October 1997 and revised November 2000. Section 3.0 of this Plan outlines Emergency Response Procedures to be followed by in the event of a fire or an oil spill at T.F. Green Airport which has entered or has potential to enter navigable waters of the United States, or has otherwise been released to the environment. The Aircraft Rescue and Fire Fighting (ARFF) Unit is the primary emergency response unit at T.F. Green Airport. ARFF capabilities include the ability to respond to fires, situations involving explosion hazards, chemical spills (oil products and hazardous materials), and other miscellaneous emergencies that threaten the safety of airport personnel and the public. This Unit notifies the RIAC Operations Unit and the DEM immediately of all spills. Also, Northstar Aviation (contract fueler for the commercial airlines at the airport) provides fuel spill response capabilities and the City of Warwick Fire Department is available to respond to airport emergencies. Outside emergency spill response contractors are typically called to handle or clean up spills that exceed the response capabilities of on-site resources (i.e., ARFF and Northstar and the Warwick Fire Department). In addition, this Section of the SPCC Plan discusses fire fighting procedures, spill response procedures, emergency response equipment, spill reporting procedures, and outside responders. All spills of oil products or hazardous materials are documented by an Airfield Incident Report and airfield incident statements and are filed with the RIAC Operations Unit, the RIAC Manager of Environmental Affairs, and submitted to the DEM within ten calendar days of the time the release is first discovered. As documented in Section 3.6 (Outside Responders) of the Plan, if necessary the City of Warwick Fire Department will act as outside responders to protect nearby persons, property, or the environment from the effects of the

release. Upon receiving the initial notification, the DEM would work with RIAC and the City of Warwick to notify the public of any significant health or safety issues should they exist.

3. BUCKEYE BROOK COALITION, DATED APRIL 27, 2004:

Buckeye Brook Coalition made the following comments regarding the draft RIPDES Permit and Fact Sheet:

Comment: “Although we are pleased that RIDEM has issued a modern draft RIPDES permit, it has been issued in the absence of adopted TMDLs for the receiving waters and therefore, the permit lacks enforceable numerical effluent limits for storm water discharges. We believe it necessary for RIDEM to establish these numerical limits.”

Response: See Response to Comments Item 4. which addresses Conservation Law Foundation’s comment regarding the development of water quality based effluent limits.

Comment: “...the permit must include provisions for RIDEM to inspect and sample, at will, at locations on airport property. We would also favor the designation of monitoring/sampling locations outside, but as close as possible to airport property, for the purpose to facilitate RIDEM sampling.”

Response: According to RIPDES Rule 14.10, the permittee shall allow the Department or an authorized representative, upon the presentation of credentials and other documents as may be required by law to:

- i. enter upon the permittee’s premises where a discharge source is or might be located or in which monitoring equipment or records required by a permit are kept for purposes of inspection, sampling or copying;
- ii. have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
- iii. inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
- iv. sample or monitor at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the State Act, any substances or parameters at any location.

In addition, RIDEM has published related policy entitled “Administrative Inspection Guidelines” finalized in January 2003. These guidelines clearly outline the RIDEM’s authority to inspect permitted or regulated facilities. This document can be found on RIDEM’s website at www.state.ri.us/dem/pubs/regs/REGS/legal/inspguide.pdf.

It is RIAC’s responsibility under Parts I.A.1-4 (Effluent Limitations and Monitoring Requirements) to sample all designated outfalls and report their findings on a quarterly basis to the DEM. DEM does not feel it is appropriate to designate in the Permit monitoring/sampling locations outside the airport property to be sampled by DEM. Based on historical investigations performed by the Office of Compliance and Inspection regarding mainly odor complaints, consistent sampling locations have been established that have been considered

representative of the outfalls discharge to the receiving water, or on Airport property.

Comment: "The April 3, 1987 RIPDES permit, 1.a. specified that the pH of the effluent shall not be less than 6.5 nor greater than 8.0 standard units at any time, unless these values are exceeded due to natural causes or as a result of the approved treatment processes. The 2004 draft permit (page 11 of 29), 5.g. allows for no greater than 9.0 standard units. This more relaxed pH limitation is "backsliding" from the limits set in the 1987 permit. The Buckeye Brook Coalition is opposed to this or any other relaxed limitations presented in the 2004 draft RIPDES permit."

Response: According to Rule 8.D.(2) Table 1 (Class Specific Criteria – Fresh Waters) of the 1997 Rhode Island Water Quality Regulations (RI WQR), the allowable pH range for all waters that receive discharges from RIAC is 6.5 – 9.0 S.U. or as naturally occurs. These RI WQR supersedes the "Water Quality Regulations for Water Pollution Control" dated September 1988 which established a limit of 6.5-8.0 S.U. Relaxation of water-quality based limits is allowed in the Clean Water Act (CWA) if the provisions of either 303(d)(4) or 402(o) are met. Limits can be relaxed if the receiving water is in attainment with the water quality standards as long as the revised limits are consistent with the State's Antidegradation Policy. Instream Monitoring data indicates that the Warwick Pond and Buckeye Brook are attaining the State Water Quality Criteria of 6.5 – 9.0. RIDEM has determined that an increase in the upper pH limit from 8.0 to 9.0 during wet weather events will not further degrade the receiving waters. RIDEM has determined that any impacts to receiving water pH resulting from increasing the effluent upper pH limit from 8.0 to 9.0 during wet weather events will be quickly buffered by the significant dilution and buffering capacity of the receiving waters. Therefore, relaxation of this limitation is allowable under the CWA 303 (d) (4)(B) and 402(o) and is consistent with the State's anti-degradation policy. No changes have been made to the permit.

Comment: "The requirement should be added that the permittee must notify RIDEM in writing that the catchbasin inserts were closed before the first application of deicing/anti-icing chemicals for the winter season and before the inserts became "frozen" in the open position."

Response: Part I.B.4.a.(3). of the permit requires the submission of a "Wet Weather Deicing Event Specific Deicing Fluid Collection and Management Report" that is to be completed for each wet weather event in which aircraft deicing occurs and submitted with the DMR forms on a quarterly basis. This report requires a daily log of collection efforts and glycol monitoring be maintained that includes the identification of any impediments to timely and efficient collection of concentrated runoff prior to dilution and observations and/or recommendations for improvements.

To ensure that the system is fully functional prior to the start of the deicing season, Part I.B.4.a.(1).ii has been revised to clarify that the seasonal collection program operating schedule shall include inspections to ensure that all aspects of the deicing fluid collection and management system are fully operational and the submission of a report to DEM with the third quarter DMR will verify this information.

4. CONSERVATION LAW FOUNDATION, DATED APRIL 26, 2004:

Christopher D'Ovidio, Esq. of the Conservation Law Foundation (CLF) made the following comments regarding the draft RIPDES Permit and Fact Sheet:

Comment: CLF has requested that "Numeric water quality based effluent limitations (WQBEL) must be in the permit to assure that the Airport's discharges will not contribute measurable and detectable levels of pollutants and violate present (state) water quality standards". In CLF's discussion they state that "any NPDES permit must contain WQBEL for all pollutants, and in particular impairing pollutants". CLF quoted EPA regulations as prohibiting the issuance of any permit 'when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under CWA'. CLF stated that, because the EPA and DEM have identified Buckeye Brook and Warwick Pond as being impaired, "this means that the level of various pollutants that cause these impairments exceeds the narrative water quality standard established for the Pond and Brook". Therefore, CLF believes that the Brook and Pond are incapable of "absorbing or diluting these pollutants" and DEM should impose WQBEL in this permit. In addition, CLF comments that "the Airport's current ADF management practices, and the proposed propylene glycol based ADF discharge limits are merely technology-based, rather than water-quality based, and are therefore not a WQBEL".

Response: Although Section 301 of the CWA requires that discharge permits include effluent limitations necessary to meet State or Tribal Water Quality Standards, effluent limitations are not defined exclusively as numeric WQBEL. To the contrary, Section 502 of the CWA defines "effluent limitations" as "any restriction established by a State or the Administrator on quantities, rates, and concentrations of ... other constituents which are discharged from point sources". Therefore, although RIPDES permits must contain conditions to ensure that water quality standards are met, DEM can use narrative conditions and best management practices to achieve this requirement. RIPDES Rule 3 defines BMPs as meaning "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage."

This concept is further outlined in the EPA's *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits* guidance document. This document clearly states that it is appropriate for storm water discharge permits to "use best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary". The EPA supports the use of BMP based permits since "numeric limitations for storm water permits can be very difficult to develop at this time because of the existing state of knowledge about the intermittent and variable nature of these types of discharges and their effects on receiving waters" and since the current methodologies for developing WQBEL "were designed primarily for process wastewater discharges which occur at predictable rates with predictable pollutant loadings under low flow conditions in receiving waters". RIPDES Rule 15.01 states that each permit shall contain conditions when applicable to adopt best management practices to control or abate the discharge of pollutants when: authorized under Section 402(p) of CWA for the control of storm water discharges; numeric effluent limitations are infeasible; or the

practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the State and Federal Acts. The draft permit contains terms and conditions to ensure compliance with water quality standards. The permittee shall implement appropriate BMPs and SWPPP as the key strategies to assure compliance with standards.

Based on the above information, the DEM has determined that the requirements contained in the draft permit are consistent with the CWA and EPA storm water permitting guidance. Therefore, the DEM has determined that it is not appropriate to add WQBEL to the draft permit at this time.

Comment: CLF has requested that “if the Department cannot currently establish numeric based WQBEL, the permit must provide a schedule to develop numeric WQBEL”. In CLF’s discussion it is stated that “Developing numeric WQBEL may difficult where the quality and quantity of pollutants discharged is currently unknown because of the lack of sampling to-date. Therefore, an effluent characterization from all discharge locations and receiving water exposure assessment is an essential and required component of the Airport’s RIPDES permit.”

Response: As stated in the previous response, DEM can use narrative conditions and best management practices in RIPDES permits to ensure that State water quality standards are met. The permittee shall implement appropriate BMPs and a SWPPP as the key strategies to assure compliance with standards. The DEM is requiring RIAC to implement BMPs, as well as, perform outfall and instream monitoring to collect information to characterize the storm water discharges from the site. The information attained from this monitoring will assist the DEM in evaluating the effectiveness of the BMPs and determine if WQBELs are necessary in subsequent rounds of the permit. Therefore, the DEM believes it is not necessary at this time to add WQBELs to the draft permit.

Comment: CLF has requested that “If WQBELs are not established in this permit, the permit must contain ‘Parameter Benchmark Values’ for those pollutants listed in part I.A.”.

CLF noted that this ‘benchmark’ approach has been followed previously for the Metals Recycling, LLC RIPDES Permit No. RI0023485. The benchmark limits recommended by CLF are as follows:

BOD(5 day)	30 mg/L
COD	120 mg/L
TSS	100 mg/L
Oil and Grease	15 mg/L
pH	6.0–9.0 s.u.
Aluminum	0.75 mg/L
Arsenic	0.16854 mg/L
Antimony	0.636 mg/L
Copper	0.0636 mg/L
Ethylbenzene	3.1 mg/L
Iron	1.0 mg/L
Lead	0.0816 mg/L
Manganese	1 mg/L
Mercury	0.0024 mg/L
Pyrene	0.01 mg/L

Selenium	0.2385 mg/L
Zinc	0.117 mg/L

In addition, CLF recommended that for those pollutants of concern identified in the draft permit without a benchmark limit given in EPA's MSGP, the permit "should impose the most conservative numeric limits derived from the 'Ambient Water Quality Criteria and Guidelines' contained in the Department's Water Quality Regulations, Appendix B, Table 1."

Response: According to the Fact Sheet of the EPA NPDES Storm Water Multi-sector General Permit for Industrial Activities (MSGP), analytical monitoring is required for discharges from certain classes of industrial facilities. To determine the industry sectors and subsectors that would be subject to analytical monitoring requirements, EPA reviewed the data submitted in the group application process that stemmed from the November 1990 promulgation of Phase I storm water regulations. EPA established "benchmark" concentrations for the pollutant parameters on which monitoring results had been received in order to perform statistical analyses to determine when analytical monitoring would be required. The benchmark concentrations are not effluent limitations, but represent a target concentration for a facility to achieve through implementation of pollution prevention measures at the facility. From this statistical analysis, EPA was able to identify pollutants for further evaluation within each sector or subsector. Next, median concentrations for each pollutant for each sector/subsector were compared to the benchmark concentrations derived by EPA (listed in Table 5 of the MSGP Fact Sheet). For each industry sector/subsector parameters with a median concentration higher than the benchmark level were considered pollutants of concern for the industry and identified as potential pollutants for analytical monitoring. EPA then analyzed the list of potential pollutants to be monitored against the lists of significant materials exposed and industrial activities that occur within each industry sector or subsector. Where EPA could identify a source of a potential pollutant that is directly related to industrial activities of the industry sector or subsector, the MSGP identified that parameter for analytical monitoring.

Sector S of the MSGP regulates Storm Water Discharges Associated with Industrial Activity from Vehicle Maintenance Areas, Equipment Cleaning Areas, or Deicing Areas located at Air Transportation Facilities. The conditions in this section apply to airports, airport terminals, airline carriers, and establishments engaged in servicing, repairing, or maintaining aircraft and ground vehicles, equipment cleaning and maintenance (including vehicle and equipment rehabilitation, mechanical repairs, painting, fueling, lubrication) or deicing/anti-icing operations which conduct the above described activities. The monitoring and reporting requirement section of Sector S requires that all airport facilities that use 100,000 gallons or more of glycol-based deicing/anti-icing chemicals and/or 100 tons or more of urea on an average annual basis shall collect and analyze samples of their storm water discharges from areas where deicing/anti-icing activities occur for the following pollutants: Biochemical Oxygen Demand (BOD₅), Chemical Oxygen Demand (COD), Ammonia, and pH. Airport facilities which use less than 100,00 gallons of glycol-based deicing/anti-icing chemicals and/or less than 100 tons of urea on an average annual basis are not required to monitor discharges resulting from deicing/anti-icing activities. The average annual usage rate is determined by averaging the total amounts of deicing/anti-icing chemicals used at the facility for the three previous calendar years. The pre-dilution volumes of deicing/anti-icing chemicals used at the facility should be

used in determining the average. For those facilities exceeding this usage rate, the storm water discharges from the facility must be monitored four times during the second year of permit coverage when deicing/anti-icing activities are occurring and from outfalls that receive storm water runoff from those areas. If the average concentration for all grab samples analyzed for a parameter is less than or equal to the benchmark value for BOD₅, COD, Ammonia, and pH then the permittee is not required to conduct quantitative analysis for that parameter during the fourth year of the permit. If the average concentration for all grab samples analyzed for a parameter is greater than the benchmark value then the permittee is required to conduct monitoring four times for that parameter while deicing/anti-icing operations are occurring in the fourth year of the permit.

From the above discussion regarding the MSGP Fact Sheet and the Sector S requirements for Air Transportation Facilities it can be seen that EPA does not apply the entire Table 5 list of benchmark values to all facilities covered under the MSGP. Sector S of the MSGP requires monitoring for BOD₅, COD, Ammonia, and pH for those facilities using greater than 100,00 gallons of glycol-based deicing/anti-icing chemicals and/or less than 100 tons of urea on an average annual basis. TF Green Airport over the course of the 2000 through 2003 deicing seasons applied an average of 78,448 gallons of pure propylene glycol, so they are not required by the MSGP to monitor their storm water outfalls for Sector S benchmarks. Thus, airports of TF Green's size according to the EPA are not required to perform analytical monitoring of their storm water discharges, but only to implement and maintain a SWPPP through the use of BMPs. In the draft RIPDES Permit the DEM has established monitoring for all pollutants of concern (including BOD₅, COD, and pH; the airport does not use urea as a pavement deicer so Ammonia is not considered a pollutant of concern) based on research of the types of industrial activities performed at the airport and the chemical composition of the aircraft deicing fluids. These pollutants are monitored on a quarterly basis during wet weather events in the RIPDES permit, as opposed to only twice or not at all according to the MSGP requirements. Also, DEM has established a benchmark (as part of the BMP-based approach) for propylene glycol based on the toxicity of the most toxic aircraft deicing fluid used at the airport. This benchmark value for propylene glycol also addresses BOD₅ and COD as the pollutants of concern. Propylene glycol exerts high oxygen demands when released into receiving waters. Based on outfall and instream monitoring and the dissolved oxygen modeling, DEM has determined that the benchmark value would also be protective of DO and addressed impacts from BOD and COD. In developing TF Green Airport's RIPDES Permit, DEM has required sufficient outfall monitoring and reporting to characterize the scope of pollutants that might potentially be detected in the outfalls based on the range of activities conducted on the airport property. In addition, the benchmark value for propylene glycol addresses all pollutants of concern identified by EPA as indicative for the Air Transportation Facility Sector of the MSGP. Therefore, it is DEM's position that it is not appropriate to include benchmark values for the parameters listed in CLF's response and that the current outfall monitoring and benchmark value for propylene glycol is sufficient to be protective of receiving water quality.

Comment: CLF has requested that "The permit must require the implementation of specific BMPs and technologies to reduce the amount of ADF and its adverse affects."

CLF further states that "airports throughout the country employ various technologies to reduce and mitigate ADF related discharges. Therefore, not only

are the following technologies and BMPs available, but also their use demonstrates their practicability as BPT/BCT/BAT.” CLF feels that by implementation of mitigation measures (e.g. advanced treatment technology) and source reduction (e.g. alternative deicing methods) at the airport the harmful effects of contaminated storm water discharges from the airport can be reduced. CLF continues to describe the mitigation measures as consisting of installation of the following: an adequate drainage system to “collect all of the Airport’s runoff before it contaminates soil and watercourses”, storm water storage tanks “to prevent untreated storm water from entering watercourses before it is treated”, dedicated aircraft washing areas, and existing innovative technologies and BMPs such as anaerobic biofiltration reduction processes, deicing capturing techniques, retention ponds, underground storage basins, and storage tanks. CLF also states that “another means to reduce ADF application, is employ alternative methods for deicing” and gives a description of infrared and forced-air deicing methods as being examples of an “innovative technology employed as a source reduction BMP”.

Response: The RIDEM has developed conditions that meet the requirements of the State and Federal Regulations. Examples of these conditions are found in Part I.B.4.a.(4) of the draft RIPDES Permit. In this Part of the Permit the DEM is requiring RIAC to develop and implement practices for the management of aircraft and pavement deicing materials that will minimize the discharge of these materials through consideration of minimizing fluids applied to aircraft through improved application methods and innovative deicing technologies and by evaluating measures that will minimize contact with storm water and the volumes of glycols used. RIAC must evaluate the feasibility of preventative anti-icing techniques and evaluate aircraft deicing fluid application practices to identify means to reduce the discharge of aircraft deicing fluid. This evaluation of practices shall include an evaluation of technologies such as hot air-low flow application equipment and techniques such as protective enclosures for applicators as well as varying the aircraft deicing fluid concentrations dependent upon ambient conditions. A plan will be submitted subject to the DEM’s approval with the goal of minimizing the discharge of deicing materials via the above listed methods. This plan requires the RIAC do the following: reduce the number and size of areas in which aircraft deicing occurs to maximum extent possible, implement automated glycol sensing controls in each of the dedicated aircraft deicing areas, provide secondary containment for all aircraft deicing fluid storage facilities, implement BMPs for the management of glycol contaminated snow or frozen precipitation, etc. The plan will identify an implementation schedule with interim milestones and a final deadline to complete full implementation of the approved plan.

In addition to the requirements of the Permit listed above that require DEM review and approval of specific BMPs evaluated by RIAC, the Permit requires the monitoring of pollutants that will lead to implementation of improved/advanced technologies. Therefore, the DEM believes the Permit is sufficient in that it requires RIAC to evaluate and submit a plan to DEM that will evaluate specific BMPs and technologies to minimize the discharge of deicing materials and include an implementation schedule subject to DEM’s review and approval.

5. FUSS & O’NEILL, INC. ON BEHALF OF RIAC, DATED APRIL 27, 2004:

Fuss & O’Neill, Inc. made the following comments on behalf of the Rhode Island Airport Corporation (RIAC) regarding the draft RIPDES Permit and Fact Sheet:

Comment: Numerous similar comments were repeated throughout the comments regarding the draft RIPDES Permit and Fact Sheet. To reduce redundancy DEM has summarized the comments as follows:

- The Fact Sheet does not demonstrate that RIDEM has complied with the minimum requirements established in Rule 15 – Establishing Limitations, Standards, and Other Permit Conditions and Rule 39 – Fact Sheet of the RIPDES Regulations.
- The Fact Sheet does not identify the basis of permit conditions, which makes many of the draft permit conditions arbitrary.
- The Fact Sheet provides no documentation as to how RIDEM concluded that all storm water with more than 1% glycol should be diverted. The permit condition is arbitrary, unsubstantiated, and excessive, and RIDEM has not specified whether this limit is technology or water quality based.

Response: The Fact Sheet clearly states the legal basis for establishing limitations and permit conditions. According to RIPDES Rule 15.01.(g) permits shall include conditions that permittees adopt BMPs to control or abate the discharge of pollutants when authorized under Section 402(p) of the CWA for the control of storm water discharges and when the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the State and Federal Acts. Also, based on review of Rule 39 (Fact Sheet) the RIDEM feels that it has sufficiently summarized the basis for the draft permit conditions including references to applicable statutory or regulatory provisions and appropriate supporting references and explained the derivation of specific effluent limitations and conditions and how they were developed. The Introduction/Background of the Fact Sheet details the appropriate regulations and statutes from where the permit conditions were based.

Comment:

- RIDEM does not present information relating permit conditions with water quality standards.
- RIDEM should state whether the individual permit conditions in this Draft Permit are technology-based, or water quality-based.
- The costs associated with proposed permit conditions are excessive especially considering that these levels of controls have not been justified as required by law.
- RIDEM does not discuss the “reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived” (40 CFR 125.3). Absent water quality based limits or technology based effluent limitation guidelines, in accordance with, RIPDES Rule 15 and 40 CFR 125.3, RIDEM is obligated to consider costs of controls in relation to their benefit.

Response: The Fact Sheet clearly outlines the permit conditions and the relation to water quality standards. Effluent limitations are not defined exclusively as numeric Water-Quality Based Effluent Limitations (WQBELs). To the contrary, Section

502 of the CWA defines “effluent limitations” as “any restriction established by a State or the Administrator on quantities, rates, and concentrations of ... other constituents which are discharged from point sources”. Therefore, although RIPDES permits must contain conditions to ensure that water quality standards are met, DEM can use narrative conditions and best management practices to achieve this requirement. RIPDES Rule 3 defines BMPs as meaning “schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce pollution of waters of the State. BMPs also include treatment requirements, operating procedures, and practices to control site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage.”

This concept is further outlined in the EPA’s *Interim Permitting Approach for Water Quality-Based Effluent Limitations in Storm Water Permits* guidance document. This document clearly states that it is appropriate for storm water discharge permits to “use best management practices (BMPs) in first-round storm water permits, and expanded or better-tailored BMPs in subsequent permits, where necessary”. The EPA support the use of BMP based permits since “numeric limitations for storm water permits can be very difficult to develop at this time because of the existing state of knowledge about the intermittent and variable nature of these types of discharges and their effects on receiving waters” and since the current methodologies for developing WQBELs “were designed primarily for process wastewater discharges which occur at predictable rates with predictable pollutant loadings under low flow conditions in receiving waters”.

RIPDES Rule 15.01.(g).4. (40 CFR 122.44(k)(4)) states that each permit shall contain conditions when applicable to adopt best management practices to control or abate the discharge of pollutants when the practices are reasonably necessary to achieve effluent limitations and standards or to carry out the purposes and intent of the State and Federal Acts. The draft permit contains terms and conditions to ensure compliance with water quality standards. The permittee shall implement appropriate BMPs and SWPPP as the key strategies to assure compliance with standards.

RIDEM has determined that it is completely within its regulatory authority to require RIAC to implement BMPs and a SWPPP as the means to attain compliance with water quality standards. These BMPs may include limitations in the form of ‘benchmark’ values, which are not technology based effluent limitations based on best professional judgement. 40 CFR 125.3.d.2 requires consideration of the “reasonableness of the relationship between the costs of attaining a reduction in effluent and the effluent reduction benefits derived” only when establishing BPT limits (through federal effluent guidelines or on a case by case basis using BPJ). All conditions of the draft Permit and Fact Sheet are not arbitrary, were explained and justified to the appropriate extent, and come from CFR’s that are necessary to carry out the purpose and intent of the State and Federal Acts.

Comment:

- This draft permit is a substantial departure from the existing RIPDES permit for this airport, existing controls at the airport, as well as the existing General Permit for storm water discharges “associated with industrial activity”.

Response: The existing Permit was issued in April 1987 and only addressed one outfall. Since the time of the last Permit was issued, EPA has published the *Preliminary Data Summary-Airport Deicing Operations (Revised; August 2000)*. In addition, a significant amount of outfall and instream monitoring has been performed. DEM has determined that existing controls at the airport are not sufficient to protect water quality of the receiving waters. DEM has identified discharges from TF Green to be a Significant Contributor and have cited RIAC for violating Water Quality Standards. DEM has outlined in writing why RIAC is not eligible for the General Permit. A General Permit would only contain generic conditions intended to address the majority of facilities with similar activities and potential for the discharge of similar pollutants. To address site specific issues, an individual permit can be tailored to include site-specific conditions.

Comment: "The Fact Sheet refers to 'remaining general conditions of the permit' (also known as Part II Standard Conditions) which RIDEM did not include in its Public Notice of the draft permit."

Response: The DEM inadvertently left out Part II (General Conditions) during the Public Notice and Hearing of the draft Permit. These General Conditions are summaries of Rule 14 (Conditions Applicable to All Permits) of the RIPDES Regulations. Rule 14.01 states that these conditions are applicable to all permits and shall be incorporated in the permit either expressly or by reference. The RIPDES Regulations were presented as an exhibit and were part of the Administrative file available for public review and comment. The conditions are inherent under Rule 14 of the RIPDES Regulations and must be adhered to by all permittees.

Comment: Regarding the discussion in the Fact Sheet about 'Outfalls and Receiving Waters', RIAC commented that "RIDEM presents no justification to monitor outfalls that may not have discharges of storm water 'associated with industrial activity'." Since the draft Permit references representative monitoring locations for particular Outfalls at the airport, RIAC believes they should have "the opportunity to fully discuss using representative outfall monitoring afforded other storm water discharges associated with industrial activity nationally and in the State of Rhode Island."

In addition, RIAC had concerns with the conditions regarding representative storm events and sampling waivers in Part I.A.5.h and I.A.5.j. of the draft Permit, respectively. RIAC felt that the representative storm event condition is overly restrictive and "this language presumes that RIAC can accurately predict depth and duration of a storm event and mobilize accordingly". RIAC also suggests the DEM remove the word "representative" and strike the remainder of the paragraph that describes the average depth and duration for events in Rhode Island. RIAC also feels that DEM should not limit the ability of the permittee to invoke a waiver as the "substantive reason for the waiver is climatic and beyond the control of RIAC". RIAC feels they would need to invoke a waiver "not only when there is no measurable precipitation, but also when an event does not fall within the specified criteria of 'representative storm event'." RIAC would like the "limitations on exercising this waiver" to be deleted.

Response: RIAC's reapplication identified 11 storm water outfalls at the airport discharging storm water associated with industrial activity from 13 drainage areas within the airport property. Outfalls with the potential to discharge similar pollutants were

divided into separate monitoring groups. During the development of the draft permit, DEM provided RIAC ample opportunity to discuss the issue of representative outfalls. At this time, sufficient data is not available to determine that two or more outfalls discharge substantially identical effluent based on a consideration of features and activities within the area drained by the outfall. However, RIDEM has considered certain single point source conveyances within the sub-drainage areas of Outfalls 004A, 006A, and 007A as being representative and monitoring only needs to occur at the main outfall locations. These sub-drainage areas were identified in the latest revisions to TF Green Airport's SWPPP. Also, because there is limited outfall monitoring currently available the RIDEM feels the monitoring is necessary to further characterize the storm water discharges from the additional outfalls identified in the reapplication. After an appropriate period of monitoring has been completed, RIDEM would consider a request from RIAC to evaluate using representative outfall monitoring.

The conditions regarding representative storm events and sampling waivers are the standard requirements from the General Permit for Storm Water Discharges Associated with Industrial Activity. The Individual RIPDES Permit developed for RIAC is consistent with how facilities authorized under the General Permit are addressed regarding these conditions. All categories of industrial activity which are permitted under the General Permit and RIPDES Regulations must collect samples from representative storm events as defined by the RIDEM. Sampling waivers, are limited to adverse weather conditions that create dangerous conditions for personnel or otherwise make the collection of a sample impracticable. If RIAC is unable to collect samples due to lack of precipitation or lack of representative storm events during the entire quarterly monitoring period and submits adequate documentation it will not be considered a permit violation. Efforts to sample an appropriate precipitation event should be scheduled early in each quarter. In most cases this will allow sufficient opportunity to reschedule sampling events prior to the end of the quarter, as necessary to sample the appropriate storm event. These reasons may be explained and noted on the quarterly Discharge Monitoring Report (DMR) forms as a "no discharge" or other valid discharge codes. Supporting documentation must be included verifying that it was not possible to monitor a representative storm event based on lack of precipitation. Therefore, the RIDEM feels that no changes need to be made to the draft Permit regarding representative storm events and sampling waivers.

Comment: RIAC commented that the table of toxicity values listed in the Fact Sheet discussion of aquatic toxicity was not accurate as the values were listed in terms of pure propylene glycol and not the ADF product. In addition, RIAC stated that one toxicity value it reported to RIDEM was "inadvertently reported to RIDEM as an LC50" and "is actually an NOEC". Therefore, it is inferred that RIDEM did not use the correct toxicity value to establish the 3,300 ppm benchmark value and that this was not discussed in the Fact Sheet.

RIAC stated that "under the current glycol collection program there is no reasonable potential for the discharge of 'toxics in toxic amounts'" based on annual toxicity-weighted calculations (sliding scale based on type and amount of deicing products used) compared to event concentrations.

Response: Upon further review the NOEC toxicity data which was reported as an LC50 value was in fact an LC10 value for testing conducted on Octagon product Octaflo EF using Fathead Minnow as the test species for a 96-hour duration test. As noted in the Fact Sheet, testing documented that Fathead Minnow

(*Pimephales promelas*) is the more sensitive species tested, that the Lyondell product exhibits aquatic toxicity at lower concentrations and that these test results serve as the basis for the associated permit conditions (the 3,300 ppm benchmark value and prohibition against the use of any ADF more toxic than those produced from the 96-h LC50 *Pimephales promelas* on the Lyondell product). The revised data provides further support for this determination (i.e. the Octagon product test result exhibits less toxicity than originally reported). It is not appropriate to revise the permit since the permit conditions that establish the benchmark value are not affected by this misreported value. Also, as RIAC will be performing hourly flow-weighted sampling for propylene glycol at the location of automated controls for each deicing event and at the storm water outfalls draining areas where deicing activities occur, the RIDEM felt it was appropriate to display the toxicity values and the benchmark in terms of propylene glycol for comparison purposes. Hence, the RIDEM has determined the benchmark value is justified in terms of manufacturer, species tested, and units displayed.

The data presented in the comments by RIAC to evaluate reasonable potential is based on flow-weighted average of annual usage for ADF product and is not event specific. Therefore, RIAC's analysis does not account for event-specific usage of each ADF (one is substantially more toxic than the other). RIDEM has determined that this is not an appropriate method to evaluate reasonable potential due to the fact that during a specific event, a greater percentage of the more toxic product could be used thereby increasing the reasonable potential to cause or contribute to a water quality exceedance. The draft Permit requires a positive control to divert ADF contaminated runoff and establishes an event specific flow weighted benchmark value to evaluate the effectiveness of the BMPs. The operator is also required to establish BMPs that include pollution prevention measures. RIDEM has determined that these BMPs when implemented will meet the narrative criteria of "no toxics in toxic amounts".

Comment: In regards to nuisance odors and bacteria conditions in the draft Permit and Fact Sheet RIAC made a number of repetitive comments. RIAC stated that they "object to RIDEM's use of the term 'nuisance' as it has a specific regulatory definition. The term 'nuisance' conveys upon the complaint or occurrence a violation of water quality standards. RIDEM should refrain from the use of the term 'nuisance' unless used in the context of the water quality standard or describing a documented occurrence." RIAC further states that "RIDEM has not demonstrated that odor complaints in and of themselves constitute a 'nuisance, or interfere with the existing or designated uses.'"

Response: In 2001, 2003, and 2004 DEM staff have documented nuisance odors in the vicinity of the storm water outfalls serving areas where deicing occurs and in the receiving waters downstream of T.F. Green Airport. From these investigations performed by the RIDEM Office of Compliance and Inspection (OCI) and the report entitled "2000-2001 Dry Weather Monitoring Report for the T.F. Green Airport" (dated June 7, 2001) odors and iron fixing/*Sphaerotilus* bacteria have been documented at RIAC's storm water outfalls serving drainage areas where deicing occurs. Stemming from these investigations OCI issued a Notice of Violation (NOV) to RIAC on September 24, 2003 that classified these odors as being a "nuisance". The NOV details how OCI inspectors have investigated and determined that some odor complaints to be causing a "nuisance" condition. The draft Permit and Fact Sheet are not implying that every odor or bacteria growth is a nuisance, but the permit conditions are attempting to be protective of water

quality and the receiving waters designated uses and trying to stop the occurrences of “nuisance” conditions for both bacteria and odors.

Comment: RIAC states that RIDEM has improperly cited its own Water Quality Regulations, as there is no mention of “foam” nor “foaming” in these Regulations.

Response: According to Rule 8(D)(b)ii of the WQ Regulations, all waters shall be free from pollutants in concentrations or combinations that “Float as debris, oil, grease, scum or other floating material attributable to wastes in amounts to such a degree as to create a nuisance or interfere with the existing or designated uses”. RIDEM considers “foam” to be a floating material in the context of the Water Quality Regulations. Therefore, Part I.A.5.m. of the draft Permit will remain unchanged and the term “foam” will continue to be used.

Comment: In regards to the 3,330 ppm benchmark value for propylene glycol, RIAC commented that the hourly flow-weighted sampling for propylene glycol at the drainage area where aircraft deicing occurs prior to the mandated automated control is overly excessive.

Response: Neither the permit nor the fact sheet specifically requires that the sampling point is located “prior” to the mandated automated control. Part I.B.4.a.(4).v. of the permit does require identification of a sampling location for the collection of flow weighted composite samples from each dedicated collection system. The intent of this requirement was to ensure that sampling of the effluent (downstream of location where storm water is diverted for collection) is required at a location as close as practicable to the deicing area. In previous comments RIAC has stated that instantaneous monitoring results should not be used for evaluation of compliance with the water quality criteria of “no toxics in toxic amounts” and that flow-weighted sampling would be more appropriate to evaluate toxicity. Comparison of the event specific and average annual results of the hourly flow-weighted sampling for propylene glycol against the benchmark value allows RIAC to evaluate the effectiveness of their SWPPP and BMPs. RIDEM recommends the installation of automatic sampling equipment. This will allow glycol collection personnel to spend their time on improving collection efforts.

Comment: RIAC has commented that for Outfall 100A (Fuel farm treatment system) “RIDEM fails to mention that this discharge is presently covered by a RIPDES general permit (RIU250210).” And that “RIDEM fails to express why general permit coverage is no longer appropriate for this discharge.”

Response: Upon further research into the above permit number it was determined that the storm water discharge associated with the AST fuel farm at T.F. Green is not covered under a General Permit. An ‘RIU’ designation refers to discharges that are not permitted for various reasons and is used to administratively track a particular case or application. Also, this issue was recently discussed with RIAC’s consultant and they were made aware of the above facts and were unable to document existing general permit coverage. Therefore, the requirements in the draft Permit and Fact Sheet regarding the AST fuel farm water treatment system discharge (Outfall 100A) into the storm water drainage system for Outfall 001A will remain unchanged.

Comment: In regards to the proposed recovered glycol processing system and related containment structure (Outfall 200A), RIAC commented that “The Fact Sheet and

draft permit should recognize the fact that the recycling system may be relocated or may not even be constructed.”

Response: If in fact the recovered glycol processing system is not built in the future, RIAC may request a modification to the Permit. According to Rule 25(f) of the RIPDES Regulations, minor modifications can be made to delete a point source outfall when the discharge from that outfall is terminated and does not result in discharge of pollutants from other outfalls except in accordance with permit limits.

Comment: Based on the monitoring requirements presented in Part I.A.1. of the draft Permit, RIAC commented that “RIDEM has included Outfall 010A for this part of the permit without any discussion of why these outfalls (002A, 003A, 008A, and 010A) are grouped together. RIAC noted that secondary deicing is infrequently conducted in this drainage area and that “Outfall 010A does not include discharges from industrial activities as compared to Outfalls 002A, 003A and 008A (e.g. fueling, maintenance).” RIAC believes the discharge from Outfall 010A is not consistent with the discharges from Outfalls 002A, 003A and 008A. RIAC is suggesting “that Outfall 010A monitoring requirements should be consistent with Part I.A.2”, and the permit should “require monitoring of propylene glycol and COD at that station if deicing is conducted in that watershed.”

Response: According to Rule 31(b)(15)(viii) of the RIPDES Regulations, those portions of Transportation Facilities that are either involved in vehicle maintenance, equipment cleaning operations, airport deicing operations, or which are otherwise identified as one of the other ten categories of facilities considered to be engaging in “industrial activity” are associated with industrial activity. The RIDEM feels that there are potential pollutants of concern associated with secondary aircraft deicing and pavement deicing within this drainage area that may come into contact with storm water during precipitation events and be discharged to Tuscatucket Brook through Outfall 010A. Based on the above RIPDES Rule those portions of TF Green Airport involved with airport deicing operations are considered to be associated with industrial activity. Therefore, RIDEM has grouped Outfall 010A with Outfalls 002A, 003A, and 008A to further characterize the discharge and its impacts on the Tuscatucket Brook watershed. If monitoring for the pollutants listed in Part I.A.1. of the Permit shows that no significant concentrations are being detected in Outfall 010A, RIDEM would consider a future request from RIAC for a major modification request to the Permit to reduce monitoring frequency and/or the pollutants being monitored.

Comment: Based on the parameters listed in Part I.A.1. of the draft Permit for Outfalls 002A, 003A, 008A, and 010A RIAC commented that “The monitoring is excessive as it lists several parameters that are not likely to be present in this type of discharge (some metals, Fecal Coliform).” RIAC also stated that “these monitoring requirements are inadequately addressed or not addressed at all in the Fact Sheet” and the characterization of these discharges “should be accomplished through a study or report rather than routine effluent monitoring requirements.” In addition, RIAC noted that monitoring for Fecal Coliform was not justified and inappropriate, monitoring for both COD and BOD₅ is redundant, and monitoring for both propylene glycol and COD is redundant.

Response: Based on RIDEM’s review of the previous reapplication, prior instream water quality studies performed by RIAC’s consultant, the EPA Preliminary Data Summary (as discussed in the Fact Sheet), and the October 30, 2003 response by RIAC to the 30-day draft Permit the monitoring requirements in Part I.A.1. of

the draft Permit have been reduced to what DEM considers appropriate. The 'Introduction/Background' and 'Effluent Monitoring Requirements' portions of the Fact Sheet adequately address the methodology and regulatory authority to require the monitoring for the pollutants currently listed in the Permit. Also, Rule 14.11 (Conditions Applicable to All Permits – Monitoring and Records) states that all permits shall specify required monitoring including type, intervals, and frequency sufficient to yield data which are representative of the monitored activity. The results of this monitoring shall be reported on Discharge Monitoring Report (DMR) forms at the intervals specified in the permit.

Monitoring for BOD₅, COD, and propylene glycol is necessary to compare the impact that deicing operations has on the levels of organic loadings being discharged from the outfalls of concern during the winter and other seasons of the year since there are other activities at the Airport that can contribute to COD loadings in the discharge. RIDEM has determined that monitoring for BOD and COD will provide valuable information that may help identify potential sources of BOD/COD loadings. In Sector S.4.a.(1). of the EPA MSGP it is specifically mentioned that during the servicing of aircraft spills or leaks of fluids such as engine oil, hydraulic fluid, fuel and lavatory waste could potentially enter the storm water system and/or be discharged to the receiving waters. Also, it is noted that spent wash water from aircraft and ground vehicle washing activities could potentially be contaminated with surface dirt, metals, and fluids (fuel, hydraulic fluid, oil, and lavatory waste).

Therefore, the RIDEM has determined that the monitoring requirements in Part I.A.1. of the draft Permit are not excessive and no changes will be made based on RIAC's comments.

Comment: The following minor revisions were suggested in the April 27, 2004 RIAC comment document:

- a. For Footnote (4) in Part I.A.2. of the draft Permit "RIDEM should replace the word "day" with the word "event" to account for events that extend across days."
- b. For Part I.A.5.b. of the draft Permit "This permit should authorize the discharge of storm water after the recycling process is complete, subject to properly established controls."
- c. For Part I.A.5.k. of the draft Permit "that would impair any usages specifically assigned to receiving waters" should be added to the end of the paragraph to be consistent with State water quality standards.
- d. For Part I.A.8.b. of the draft Permit the word "having" should be deleted from the statement "refractometer having capable".
- e. For Part I.A.8.c. of the draft Permit the second sentence should be rewritten to state: "No discharge shall be allowed unless monitoring determines that propylene glycol is present below these levels in accumulated storm water."
- f. For Part I.A.8.d. of the draft Permit the term "clean" should be deleted as a modifier for storm water.
- g. For Part I.B.4.c. of the draft Permit RIAC suggested the following modifications:

"Within twenty-four (24) hours of being notified by RIDEM that an odor complaint that violates state water quality standards has been received, the permittee shall perform the following:"

- i. "Inspect all outfalls associated with the complaint for dry weather flows..."
- ii. "Obtain in stream samples at the location of the odor complaint and analyze for propylene glycol"
- iii. "Inspect storm water collection system and appurtenances and deicing areas associated with the complaint for evidence of residual glycols and take appropriate actions to mitigate the suspected source of the odors."

Laboratory analysis may not be available within fourteen days as such we request that the report be submitted within 5 days of receipt of laboratory analysis.

- h. For Part I.B.4.c. of the draft Permit "Please clarify what RIDEM intends by 'bacteria growth'. Specifically RIDEM must identify the species of bacteria."
- i. For Part I.B.4.e.(2) of the draft Permit Part I.5.c. should be changed to Part I.A.5.c.
- j. For Part I.B.h.(1) of the draft Permit "Sampling location 4. Old Mill Creek (at Tidewater Drive) is not an appropriate sampling location. As an alternative, we suggest monitoring be conducted at Buckeye Brook (at the Route 117 crossing) to be consistent with previous monitoring efforts conducted by RIAC."
- k. For Part I.A.1. and Part I.B.h.(1) of the draft Permit "In the introduction to this section, sampling is required in conjunction with outfall monitoring specified in Part I.A.1. However, this paragraph specifies Parts I.A.1 and I.A.2. Also, this section mandates the sampling must occur "while aircraft deicing is occurring". This is not specified in Part I.A.1. or Part I.A.2."

Response: Based on review of the above suggested changes by RIAC, RIDEM made the following minor revisions to the draft Permit:

- a. For Footnote (4) in Part I.A.2. of the draft Permit RIDEM replaced the word "day" with the word "event" to account for events that extend across days.
- b. For Part I.A.5.b. of the draft Permit RIDEM added the following language to the last sentence of the paragraph, "except the discharge from Outfall 200A of accumulated storm water from the containment structure associated with the recovered glycol processing system as established in Part I.A.4." This statement authorizes the discharge of storm water after the recycling process is complete.
- c. For Part I.A.5.k. of the draft Permit RIDEM added the following language to the end of the paragraph, "that would impair any usages specifically assigned to receiving waters".
- d. For Part I.A.8.b. of the draft Permit the word "having" was deleted from the statement "refractometer having capable".
- e. For Part I.A.8.c. of the draft Permit RIDEM changed the second sentence to state: "No discharge shall be allowed unless screening determines that propylene glycol is not present in accumulated storm water above these levels."
- f. For Part I.A.8.d. of the draft Permit the term "clean" was deleted as a modifier for storm water.
- g. For Part I.B.4.c. of the draft Permit RIAC RIDEM added the following: "that violates state water quality standards" to the first sentence of the

second paragraph, "associated with the complaint" after 'Inspect all outfalls...' in Part I.B.4.c.i., "at the location of the odor complaint" after 'Obtain instream samples...' in Part I.B.4.c.ii., "associated with the complaint" after '...appurtenances and deicing areas...' in Part I.B.4.c.iii., and "five (5) days of receipt of laboratory analysis for the abovementioned instream samples" after 'Within...' in the third paragraph.

- h. For Part I.B.4.c. of the draft Permit RIDEM identified the species of bacteria as "iron-fixing and/or *Sphaerotilus*" in the first sentence of paragraph five.
- i. For Part I.B.4.e.(2) of the draft Permit Part I.5.c. was changed to Part I.A.5.c.
- j. For Part I.B.h.(1) of the draft Permit the RIDEM has decided to leave Old Mill Creek (at Tidewater Drive) as a sampling location for the instream water quality monitoring required under this section. Buckeye Brook at the Route 117 crossing has already been included as Buckeye Brook at West Shore Road. The RIDEM believes this is an acceptable monitoring location to gather further downstream sampling data during winter deicing events.
- k. "Part I.A.2." was added to Part I.B.h. of the Permit to coincide with Part I.B.h.(1) of the Permit so that the instream water quality monitoring can be coordinated with sampling events required by Parts I.A.1.-2. of the draft Permit. RIDEM's intent of monitoring during the aircraft deicing season (Quarters 1 and 4 of the calendar year) under Parts I.A.1.-2. of the draft Permit was for the sampling to occur during the course of an aircraft deicing event. As a means to further clarify this intent the following changes listed below were made to the draft Permit. In Part I.A.1. of the draft Permit Footnote (6) was modified so that a precipitation event for Quarters 1 and 4 will be monitored "while aircraft deicing is occurring". Also, in Part I.A.2. of the draft Permit Footnote (5) was modified in the same manner and in Footnote (6) the language "per the requirements of Footnote (5)" was added so that sampling for Flow, pH, Oil&Grease, and TSS will occur during a precipitation event while aircraft deicing is occurring.

Comment: RIAC commented that for Part I.A.3. of the draft Permit, which specifies effluent limitations and monitoring requirements for Outfall 100A (the effluent from the AST fuel farm water treatment system), "the draft permit does not specify how average monthly or maximum daily observations are to be calculated. The permit should provide clarification, since, as written, a single measurement could constitute two separate violations of the permit."

Response: DEM does not agree that this level of detail should be included in the permit and has prepared guidance documents to address specific reporting requirements. In the document entitled "Instructions for Completing Discharge Monitoring Reports (DMR)", which are sent to permittees along with their DMR forms, examples are given for calculating monthly average and daily maximum concentrations. In the instance where one sample is being taken per month, the monthly average and daily maximum values would be the same. However, for quarterly reporting the monthly average values for the three month reporting period are averaged and the highest daily maximum value are those reported on the DMR. In the case where only one sample is taken per quarter and both values exceed the given limits then it is correct that a single measurement could constitute two separate violations. If this is a concern for the permittee, more than one sample (the minimum permit requirement) should be collected.

Comment: Based on the conditions in Part I.A.5.d. of the draft Permit RIAC has questioned whether RIDEM meant to prohibit “all discharges from trench drains to storm sewers or just internal building trench drains”. RIAC noted that many ramp areas of the Airport use trench drains as a common means of collecting and conveying storm water to the drainage system.

Response: The prohibition in Part I.A.5.d. of the draft Permit was intended to apply to floor drains and trench drains located inside of buildings and/or hangars that discharge to the separate storm sewer system or directly to waters of the State. This clarification was made to Part I.A.5.d. of the draft Permit.

Comment: Based on the conditions in Part I.A.5.g. of the draft Permit RIAC questioned whether the phrase “natural causes” was used to account for the pH of precipitation.

Response: Rule 8.D.(2) Table 1 (Class-Specific Criteria – Fresh Waters) of the Rhode Island Water Quality Regulations states that for all classes of fresh water the acceptable pH range is from 6.5 to 9.0 or as naturally occurs. The term “naturally occurs” is used to account for the pH of precipitation, groundwater, or other naturally occurring influences that may affect the pH value achieved in the effluent of an outfall for a RIPDES Permit. As stated in Part I.A.5.g. of the draft Permit the ‘approved treatment process’ would be more applicable to the situation where RIAC has fully complied with the Permit requirements, but exceeded pH due to the pH of precipitation (which may not be naturally occurring).

Comment: RIAC made a number of comments regarding the draft Permit requirements for Part I.B.4.a.(1) (Collection Program Operating Procedures) and Part I.B.4.a.(4).v. (Aircraft and Pavement Deicing Material, Usage, Storage, and Collection). For Part I.B.4.a.(1) RIAC noted that “developing procedures for existing practices and enumerated general requirements is achievable within the specified 180 days (Part I.B.2).” However, several items may take more time to develop, such as, glycol interceptor equipment for other deicing areas, glycol storage tanks, and the glycol processing facility (which RIAC may abandon due to other permit requirements).

For Part I.B.4.a.(4).v. RIAC commented that “this provision mandates that RIAC reduce the number and size of deicing areas, but does not express the goal to be achieved.” RIAC also wanted further clarification regarding the purpose of the “hourly monitoring of glycol concentrations in the runoff”. In addition, it is noted that “this provision appears to ignore that RIAC has a ‘dedicated storm water collection system’ by virtue of designated deicing areas and catch basin inserts with storm drains that only drain runoff from the dedicated deicing areas” and “the storm water collection system is not designed to minimize dilution from other storm water or groundwater.” Therefore, RIAC feels that the minimization of dilution to the storm water collection systems “would be extremely capital intensive and extend well beyond the 180 day time frame to develop and/or implement a plan.” Finally, in regards to the final requirement of this section, RIAC believes “it is impossible to develop a schedule to fully implement a plan within 180 days of RIDEM approval.”

Response: In regards to the schedules required in Part I.B.2. and Part I.B.4.a.(4).v. of the draft Permit, RIDEM would like to clarify that the intent of these schedules was not as it is construed in the Permit. Part I.B.2 requires submission of an

amended SWPPP within one hundred and eighty (180) days after the effective date of the Permit. This SWPPP would include amendments concerning the additional BMPs described and mandated by Part I.B.4. of the Permit. For those items required by Part I.B.4.a.(4).v. of the draft Permit, it was DEM's intention that the SWPPP would include a detailed plan and implementation schedule subject to the Director's approval. This implementation schedule will include interim milestones and a final deadline to complete full implementation of the approved plan. Therefore, the following minor technical change will be made to this paragraph: "Identifies an implementation schedule with interim milestones and a final deadline to complete full implementation of the approved plan. RIAC shall fully implement the plan upon approval by RIDEM."

In regards to the minimization of dilution, RIDEM believes that RIAC should acknowledge that they have significant dilution and consider redesigning their storm water collection system to minimize dilution to the maximum extent practicable.

Comment: Based on the requirements in Part I.B.4.a.(2) (Annual Deicing Fluid Collection and Management Report) and Part I.B.4.a.(3) (Wet Weather Deicing Event Specific Deicing Fluid Collection and Management Report) of the draft Permit RIAC commented that the "RIDEM should be less proscriptive in the requirements of the report, or as an alternative allow RIAC as part of the SWPPP amendment to present a report format for review and approval by RIDEM." Also, RIAC made numerous suggestions of revisions to existing language and conditions in the draft Permit.

Response: RIAC will have the opportunity to submit a report format for review and approval as part of the amended SWPPP submittal required in Part I.B.2. of the draft Permit. Upon review and approval of the SWPPP changes can be made to the Permit to clarify if necessary. Therefore, RIDEM did not make any changes to the draft Permit language based on RIAC's interpretation of these reporting requirements.

Comment: Based on the requirements in Part I.B.4.a.(3) for the 'Wet Weather Deicing Event Specific Deicing Fluid Collection and Management Report' RIAC commented that monitoring at a catch basin insert unless the insert is going to be opened is "pointless" and the requirement is excessive and arbitrary.

Response: RIDEM included the monitoring at catch basin inserts to ensure that glycol collection personnel monitor ADF contaminated storm water at the catch basin inserts in a timely manner and regular intervals to reduce excessive dilution, enhance collection efficiency, and minimize the discharge of glycol. Without this requirement, collection could be avoided by delaying monitoring until sufficient runoff has occurred to dilute glycol below the collection thresholds established in the permit.

Comment: Based on the requirements in Part I.B.4.a.(4).v. (Aircraft and Pavement Deicing Material Usage, Storage, and Collection) of the draft Permit RIAC questioned the purpose of "identifying a sampling location in each of the dedicated collection systems".

Response: This requirement is not related to the effluent limitations and monitoring requirements prescribed under Part I.A.1 of the draft Permit. However, the identification of a sampling location in each of the dedicated collection systems is

directly related to the requirements of Part I.B.4.a.(4).vi. of the draft Permit. In accordance with this section the permittee must take hourly flow-weighted samples for propylene glycol over the course of each wet weather event in which airplane deicing occurs at the approved sampling locations identified in Part I.B.4.a.(4).v. These flow-weighted average values of propylene glycol for each wet weather event are then compared to the benchmark value of 3,300 ppm of propylene glycol.

Comment: Based on the requirements in Part I.B.4.c. (Nuisance Odor and Bacteria Growth Response) of the draft Permit, RIAC commented that the "language (the second paragraph iii on page 20 of 29), as written, is extremely burdensome as it requires an investigation of potential groundwater contamination associated with every complaint associated with dry weather."

Response: RIDEM intended that any additional investigation of potential groundwater contamination to be in direct relation to the requirements of Part I.B.4.e. (Illicit Discharge Detection and Elimination). In this section of the draft Permit the permittee must conduct semiannual dry weather field screening for non-storm water flows (i.e. groundwater) and field tests of selected parameters. Any additional investigations stemming from nuisance odor complaints that require investigation of dry weather discharges from storm water outfalls may be coordinated with dry weather field screening as a means of eliminating illicit discharges of contaminated groundwater.

Comment: Based on the SWPPP requirements in Part I.B.4.e. (Illicit Discharge Detection and Elimination), Part I.B.4.f. (Post Construction Storm Water Management in New Development and Redevelopment), and Part I.B.4.g. (Drainage Master Plan) of the draft Permit, RIAC made numerous comments stating these requirements are "overly broad", "excessive", "not defined, nor substantiated", "beyond the authority of RIAC", "arbitrary", "expensive", and "unprecedented".

Response: The RIDEM has broad authority to mandate the implementation of BMPs in a SWPPP, as described in the Introduction/Background of the Fact Sheet. The RIDEM has carefully considered and reviewed all comments concerning these specific sections of the draft Permit and feels these requirements are necessary and appropriate, and therefore, no changes have been made to the draft Permit.

HEARING REQUESTS

If you wish to contest any of the provisions of this permit, you may request a formal hearing within thirty (30) days of receipt of this letter. The request should be submitted to the Administrative Adjudication Division at the following address:

Bonnie Stewart, Clerk
Department of Environmental Management
Office of Administrative Adjudication
235 Promenade Street, 3rd Floor
Providence, Rhode Island 02908

Any request for a formal hearing must conform to the requirements of Rule 49 of the State Regulations.

STAYS OF RIPDES PERMITS

Should the Agency receive and grant a request for a formal hearing, the contested conditions of the permit will not automatically be stayed. However, the permittee, in accordance with Rule 50, may request a temporary stay for the duration of adjudicatory hearing proceedings. All uncontested conditions of the permit will be effective and enforceable in accordance with the provisions of Rule 49.